MAR 19 1930

SERIES 3, Vol. 13, No. 3 MARCH, 1930

AMERICAN JOURNAL OF OPHTHALMOLOGY

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Copyright 1930, Ophthalmic Publishing Company, 7 West Madison Street, Chicago

Subscription twelve dollars yearly. Single number, one dollar twenty-five cents.

PUBLISHED MONTHLY BY THE OPHTHALMIC PUBLISHING COMPANY

PUBLICATION OFFICE: 450 AHNAIP STREET, MENASHA, WISCONSIN

EXECUTIVE OFFICE: 508 METROPOLITAN BUILDING, SAINT LOUIS, MISSOURI

EDITORIAL OFFICE: 530 METROPOLITAN BUILDING, DENVER, COLORADO

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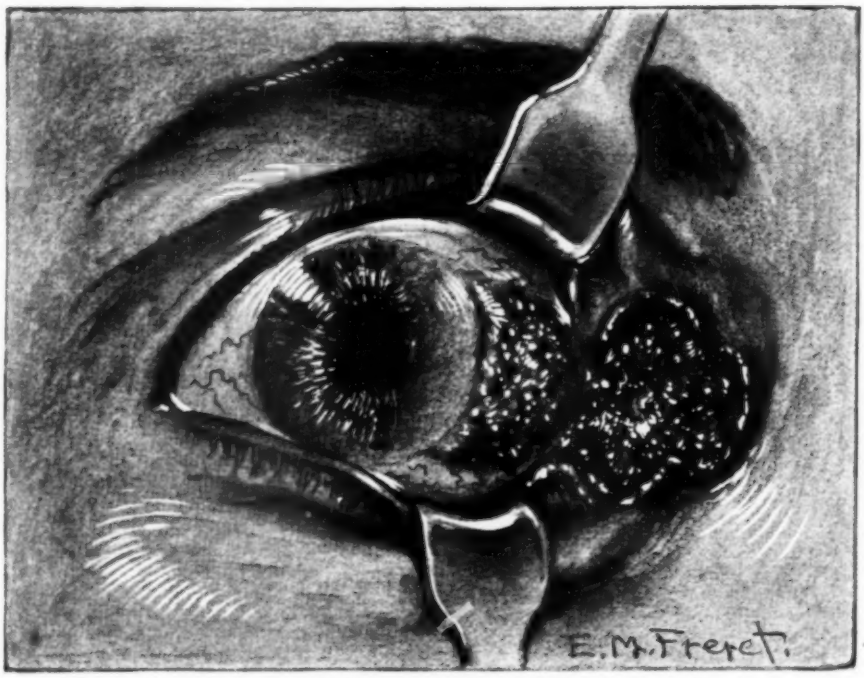
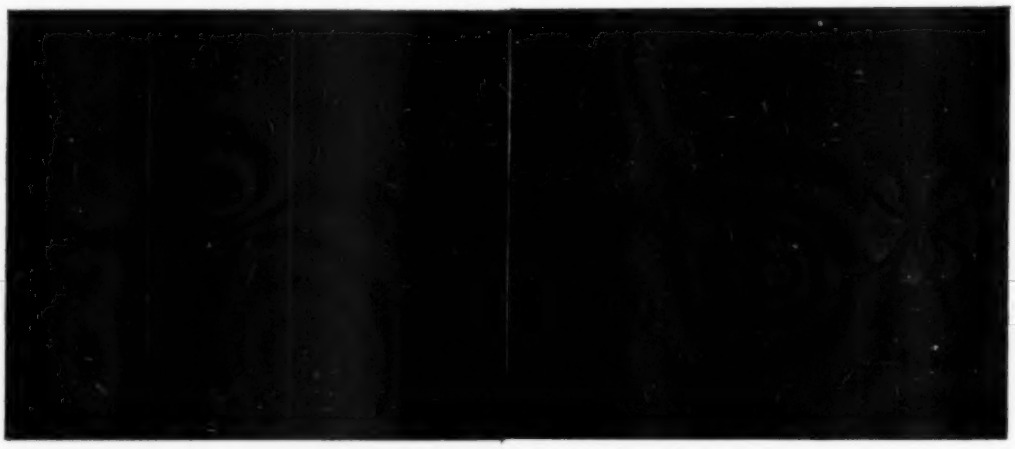


FIG. 1. EPIBULBAR CARCINOMA (BEN WITT KEY).



FIGS. 2 AND 3. SUBHYALOID HEMORRHAGE (FREDERICK O. SCHWARTZ).

UNIV. OF MICH.

AMERICAN JOURNAL OF OPHTHALMOLOGY

Volume 13 March, 1930 Number 3

A CASE OF EPIBULBAR BASAL CELL CARCINOMA WITH PENETRATION OF THE GLOBE

BEN WITT KEY, M.D., F.A.C.S.

NEW YORK CITY

The primary location of the carcinoma was in the angle of the nasal commissure. In its later stages it advanced very rapidly, so that changes were noted daily in the deep layers of the cornea. Its pathway of penetration of the globe was along the anterior ciliary vessels, without the deeper nonresisting orbital structures having apparently become involved. Its growth was remarkably symmetrical, a fact which is probably related to the mechanical stimulus of lid action and of ocular convergence. Read before the American Ophthalmological Society, at Hot Springs, Virginia, June 10 to 12, 1929.

The type of case which is rare and which is still more seldom observed through its entire course is usually considered as possessing a special clinical and pathological importance. But a case which fulfills this requirement and also presents atypical features in development and in the morbid anatomy of the lesion is especially calculated to arouse our professional and scientific curiosity. The present case report may be thus classified.

The patient was a man, P. C., aged sixty-two years, an Italian laborer, who came to the New York Eye and Ear Infirmary on December 16, 1926. He complained of a rapidly growing "sore" at the inner angle of the right eye, which had been first noticed in June, six months before, as a small ulcerlike thickening at the junction of the conjunctiva of the caruncle and the adjoining skin. At first the irritation of the small mass led to many forms of treatment, but with only increasing irritation, until now the "sore" had spread out upon the skin of both upper and lower lids and along the side of the bridge of the nose. At the same time it had rapidly involved the bulbar conjunctiva, with considerable thickening and ulceration, and had even attacked the eyeball, which had become displaced slightly forward and toward the temple.

The family history was negative, so far as could be learned from the relatives. The patient's father and mother died from causes not important in his case. There were three brothers and a sister, who were living and well. The previous medical history gave no information that seemed to have any bearing on the present ocular condition.

On examination it was noted that a large ugly fleshlike ulcer, with highly vascularized and thickened margins, entirely occupied the nasal portion of the right orbit anteriorly, making itself conspicuous by its symmetry of outline and its apparent serpentlike attack. (See color plate). Its creeping advance upon the skin was marked by sharply defined and symmetrically curved outlines above and below upon the lids, with almost an exactly similar outline along the side of the nose, thus presenting a rounded leaflike formation placed horizontally at the nasal commissure. Each portion of this three-petal leaflike lesion of the skin measured approximately eight millimeters in diameter, making a total of sixteen millimeters as the diameter of the whole mass involving the skin.

In the canthus there was noted more evident loss of substance, with bits of new tissue protruding, in course of ulceration and of being thrown off by the mechanical force of the lids. Along

the ciliary region of the globe the same appearance was noted, except that here there was more thickening, and the irregular mass extended a little deeper into the orbit, clinging to the globe somewhat posteriorly, and thus on its way to become peribulbar, if allowed to advance. Here, also over the ciliary region of the globe, the mass was symmetrical in outline, the conjunctiva being destroyed in its path, but the margins of the lesion above and below extended across to the corneal limbus almost exactly equidistant from the horizontal plane of the globe.

The cornea had not escaped, but its epithelial surface was not visibly involved. Here one of the most striking pathologic changes, visible to the normal eye even without magnification, was observed to take place as the case was followed from day to day. This was the comparatively rapid edema and basal cell invasion of the corneal stroma, beginning at the nasal limbus, at the same time occupying the nasal iris angle, and progressing directly temporalward toward the pupillary area in the form of a whitish cloud in the corneal substance.

Not only was this in itself an interesting spectacle, but here again the symmetry of development in the process made it doubly so, because this corneal invasion was observed to be evenly distributed through the corneal substance as a vertical straight line of nebulous opacity passing across the cornea (as illustrated by the color drawing, see frontispiece). If a moving picture of this rapid change could have been photographed, and later sped up for demonstration, it might have been possible to show something of the symmetry and rapidity of this process, which was so fascinating to those who observed it.

Not until the corneal cloud had encroached upon the pupillary area, and the impairment of vision had impressed the patient with the danger before him, would the ignorant fellow submit to operation. There was little pain; there was no deep pericorneal injection; the temporal half of the cornea was clear and transparent; the iris was of normal color; the pupil was round and regular, and until the last few days (when finally the nasal portion of the iris became thickened by the cancerous ingrowth) was quite active in response to light. The tension of the eye was not elevated, but on the contrary was about the same as that of the fellow eye; on one occasion, even, it was slightly subnormal. Coincident with the rapid advance upon the globe, there was gradual protrusion of the eyeball with ten to fifteen degrees of deviation temporalward. The left eye was normal.

The ophthalmoscopic examination was interesting in that the media of the eye were fairly clear and transparent and there were only a few floating particles in the vitreous, perhaps consistent with the normal in the eye of a man sixty years of age. There was, however, some congestion of the fundus vessels, but at no time could detachment of the retina or other evidence of intraocular disease be detected in the vitreous chamber. The vision of the eye was unimpaired until the nebulous opacity of the cornea passed over the nasal pupillary area.

The further progress of this case was followed for two weeks in the outpatient department, because the patient at first refused admission. At the time of his admission to the Infirmary, December 16, 1926, the mass had attacked and evidently entered the ciliary region of the eyeball, and the deep corneal substance at the limbus was just beginning to be involved. The time consumed therefore in the advance of the growth from the iris angle into the iris and across the cornea to the pupillary center was calculated to be fifteen days (December 24, 1926, to January 8, 1927, the date of exenteration).

A small portion of the mass clinging to the globe was excised for microscopic examination, and it was reported by Dr. Samuels to be basal-cell carcinoma. The bacteriological examination of conjunctival smears showed considerable pus, a few cocci (longus) and a number of bacteria. Examination of the blood revealed nothing of import-

ance, and the Wassermann was negative to heat fixation, cold fixation, and precipitin (Kahn) tests. The rhinological examination was negative.

The x-ray report was as follows: "The frontals are clear. Some thickening of the antra, especially the left. There is less detail in the right orbit than in the left, but decided evidence of the outline of a tumor is not present." The radium therapist (Dr. G. A. Robinson) reported: "P.C., number 29554, has an extensive basal-cell carcinoma of the inner canthus, extending along the nasal side of the eye and orbit and also infiltrating the cornea. The lesion is too far advanced to be treated primarily by radium. A large dosage would be required and it would probably be harmful to the structures and only produce a very painful reaction. I would suggest removal of the growth together with the surrounding parts, and then postoperative radium treatment applied to the nasal side of the orbit."

In view of these findings, on January 8, 1927, I exenterated the orbit, with dissection of the nasal skin clear of the growth, and going directly through the periosteum at the nasal side and along the orbital rim. The contents of the orbit, including the lids and periosteum, were snared close into the apex of the orbit with the Eves tonsilar snare. The patient made an uneventful recovery, and there was noticeable increase in weight. The orbital cavity healed by granulation in the usual manner. The patient was discharged from the Infirmary January 19, 1927. Four postoperative radium treatments were applied by Dr. Robinson. About three months after his discharge, the man returned to the Infirmary, complaining of an enlargement of the glands of the right side of the neck. There was no evidence of recurrence of the growth in or about the orbital cavity, which was clean and completely healed. It was assumed that metastasis had taken place prior to removal of the orbital mass. He was referred at once to the Skin and Cancer Hospital.

The histologic examination of the specimen may be graphically shown in some detail by the photomicrographs made for illustration.

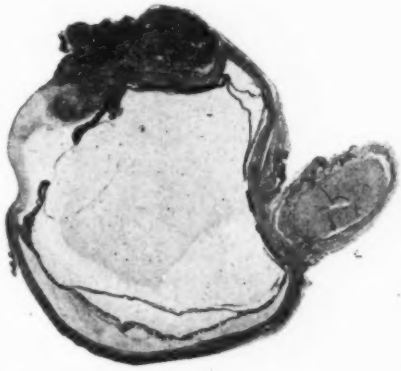


Fig. 1 (Key). Location of the mass in its gross relationship.

Figure 1 shows the extension of the mass into the globe along the ciliary region, apparently forcing an entrance along the ciliary vessels, consuming parts of the sclerotic and pushing against it posteriorly. The iris and ciliary body are thickened by the ingrowth; the iris angle is obliterated; the corneal stroma is involved as described in the gross specimen, while the epithelium remains fairly intact.

Figure 2 shows a magnification of the growth, its destruction of the sclerotic along the ciliary vessels, its progress into the corneal stroma, and the iris and ciliary body invasion.

In figure 3 the entire mass is magnified, showing the extension posteriorly beyond the ora serrata, with a pushing in and kinking of the sclera at its extreme limit, the process being most destructive along the ciliary vessels. The choroid and retina are not involved, this fact being confirmed by the highest magnification. The top of the growth is irregular, due to a portion having been removed in making the section, in which it will be shown later as a rounded complete mass with a segment of the orbital tissue.

Figure 4 shows the character of the invasion in the cornea, stopping short of and without involving the epithelium, its progress being most rapid as it crept along the interstitial spaces

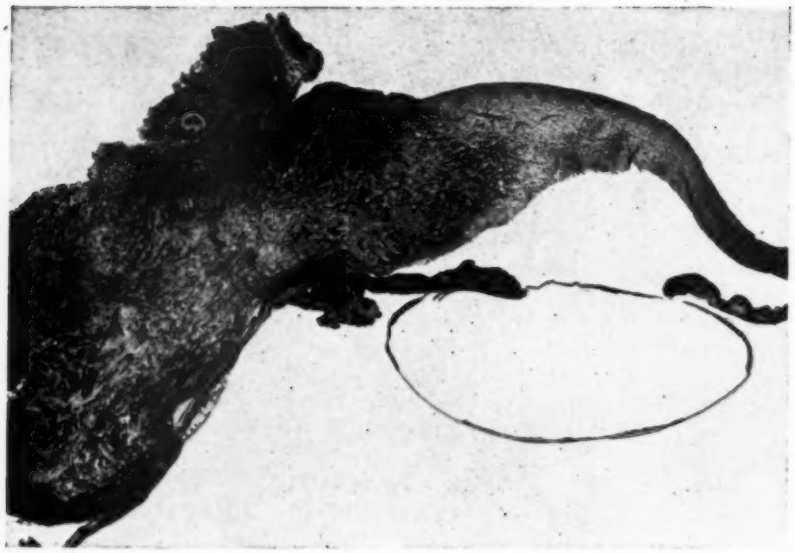


Fig. 2 (Key). Character of the mass at limbus of cornea with destruction of sclerotic and obliteration of iris angle.

in the stroma, and especially in the posterior layers giving evidence of its pathway along the ciliary vessels and from them to the deep cornea. Here endothelium and Descemet's membrane have been destroyed. The gradual thickening with ingrowth into corneal substance is consistent with the clinical observations related above. The same corneal change is noted in a higher magnification in figure 5, where the character of the tumor is noted, and destructive processes are present in the corneal stroma.

Figure 6 shows the limiting of the advance in normal cornea, the point to which the symmetrically arranged vertical line of opacity was observed clinically to have reached when the patient finally submitted to operation.

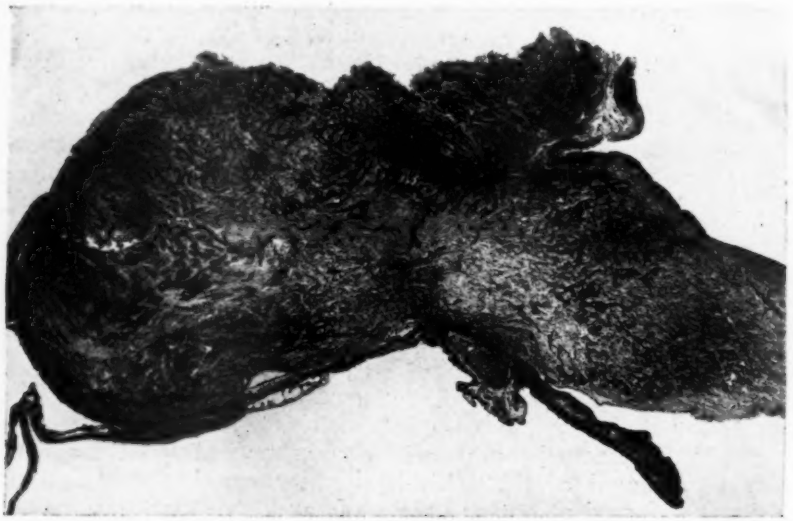


Fig. 3 (Key). Extension of the mass posteriorly. Complete destruction of sclera at entrance of ciliary vessels.

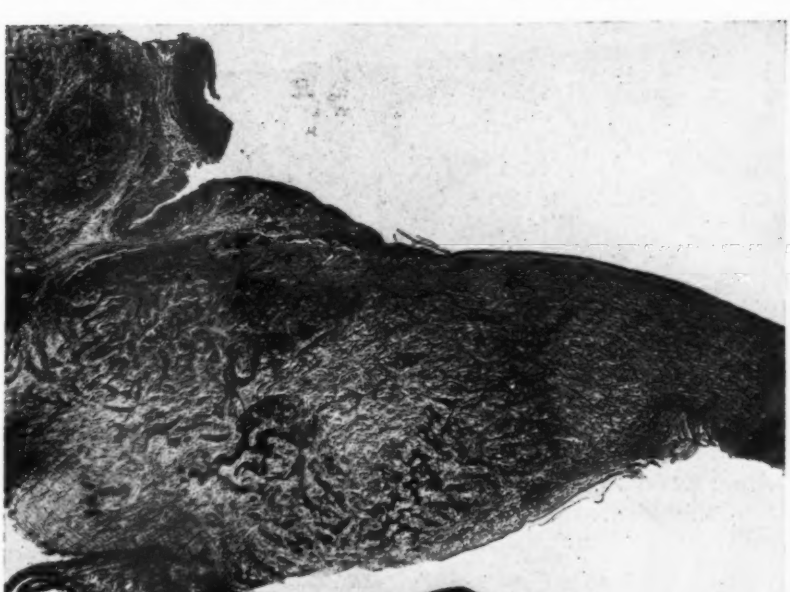


Fig. 4 (Key). Corneal involvement at the limbus extending into the perichoroidal space.

Fig. 5 (Key). Character of growth in cornea magnified.

Fig. 6 (Key). Limit of corneal involvement over pupillary center.

The epithelium is not involved, but in the stroma of the cornea is noted the first line advance of the malignant process.

In figure 7 the high magnification reveals the basal-cell type of carcinoma so well known for its rapidly destructive character.

Figure 8 presents the rounded top portion of the growth, with adjacent orbital tissue which is visibly involved, the process having advanced more superficially, as though intent upon destroying the ever moving and converging eyeball.

Discussion

It is well known that the great majority of epibulbar carcinomata originate in the conjunctiva, usually at the point where its epithelium passes into the corneal epithelium with certain morphological changes. More rarely they may originate in the bulbar conjunctiva, in the semilunar fold or the lacrimal caruncle or their glands. These are squamous-cell epitheliomata or this type with intercellular mucinous degeneration. The predilection of malignant neoplasms for developing in places where epithelium of the skin passes

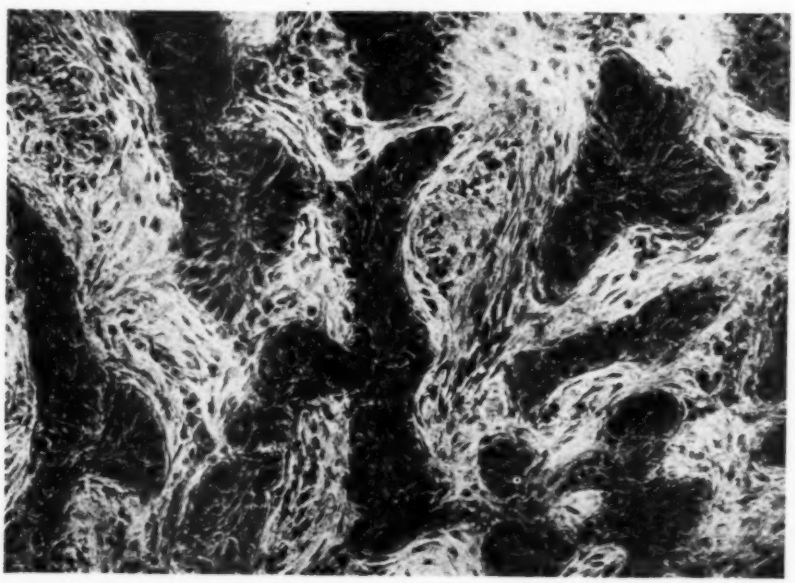


Fig. 7 (Key). Basal cell character of the mass.

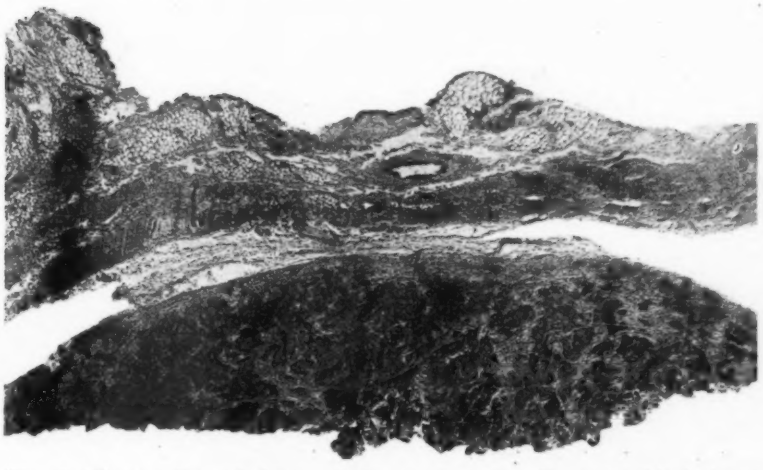


Fig. 8 (Key). Rounded top of the mass with adjacent orbital tissue not involved.

over into that of the mucous membrane is so well recognized that the site of origin of the one here reported needs no elucidation. But it is significant in one respect, namely that its beginning was in the very angle of the inner commissure, which may account at least in some degree for the apparently peculiar symmetry of its development.

This epithelioma is easily distinguished both morphologically and histologically from that originating at the corneal limbus. Its cellular structure and rapid advance are characteristic.

Penetration of the wall of the eyeball, with invasion of its interior, occurs very rarely in epibulbar carcinoma, however extensive the process may be. In addition to three of his own cases and seven reported by E. Fuchs, Sattler found only twelve cases in the literature. Penetration is known to occur by three routes. The most frequent is that taken by the carcinomatous growth in the region of the limbus which advances to the internal sclerotic sulcus along the corneoscleral border, obstructs Schlemm's canal, and invades the ciliary body and perichoroidal space through the corneoscleral stroma.

Much less frequently, according to Sattler, penetration takes place along the ciliary vessels as they pass through the sclera to the ciliary body. Since this route is the usual path by which intraocular tumors break through the exterior, it seems strange that it is not the most frequent pathway for penetrating carcinoma, but this is explained by the fact that the entrance and exit of the ciliary vessels lie too far back, where the limbal carcinoma of the sclera is not closely adherent. The third route of penetration, the rarest of all, is by way of corneal substance directly to Descemet's membrane; there it reaches Schlemm's canal, from which it invades the ciliary body and perichoroidal space.

It is noted, therefore, that the pathway of penetration of the globe in the case now reported is consistent with that previously observed, and is that which anatomically we should anticipate—by way of the ciliary vessels.

It may be of interest and of some significance to point out in summary the following observations in this case: (1) The primary location of this carcinoma was in the angle of the nasal commissure. (2) Its exceedingly rapid advancement was similar to that of an infection, changes being noted daily, especially in the layers of the deep cornea. (3) Its pathway of penetration of the wall of the globe along the anterior ciliary vessels, and apparently without involving the deeper nonresisting orbital structures, is noted. Penetration occurred with a curiously de-

structive influence upon the two chiefly resisting membranes of the globe—both sclera and Descemet's membrane. Its penetration without vitreous changes, until the last few days before exenteration, is an interesting observation as evidence of the resistance of the choroid to carcinomatous invasion. (4) Its symmetry of development as it invaded each structure in its path—lids, conjunctiva, sclera, and cornea—all of which may be attributed to its primary location followed by the mechanical irritation of the lids and by the act of convergence of the globe.

While these carcinomata are known to advance by contiguity with preference for ectodermal structures (as well as by metastasis), it seems quite significant with what symmetry the malignant energy of the mass advanced in this case, and the observation supports the theory of activation by mechanical force or irritation, which again is related to the idea of motion, force, heat, or injury—in fact any form of energy in excess of the normal—being a factor in the origin and development of malignant disease. With this in mind, it is not difficult to recognize how the effect of the mechanical force of the lids and the frequent convergence of the globe against this highly malignant growth, constantly in the path of their normally active functions, could produce this rapidly forming, almost perfectly symmetrical, pathology.

100 West Fifty-ninth street.

SUBHYALOID HEMORRHAGE

FREDERICK OSCAR SCHWARTZ, M.D., F.A.C.S.
SAINT LOUIS

Figures 2 and 3 of the color frontispiece to this issue of the American Journal of Ophthalmology illustrate the characteristic appearance of this type of hemorrhage, and also the changes which lead to disappearance of the hemorrhage. Read before the Saint Louis Ophthalmic Society, November 22, 1929.

The presence of extravasated blood between the retina and the vitreous body is of uncommon occurrence and has been designated as preretinal or subhyaloid hemorrhage. Very infrequently seen in adults, the condition is exceedingly rare in children except as the result of traumatism. One case in a child of four and one-half years has been reported by Harms.

Subhyaloid hemorrhage was first fully and accurately described by Hotz, and histologic studies of one case which were made by J. Herbert Fisher seemed to show that the blood came from a minute vessel, and, detaching the internal limiting membrane from the remaining retinal layers which were not harmed, spread into and filled the space which was formed. However, the exact source of this variety of intraocular hemorrhage and its anatomic situation are still in dispute.

These hemorrhages are usually of large size, covering the entire macular region and including an area several disc diameters in the vertical and horizontal directions. By contrast, Würdemann has shown two pictures of a single case where the extravasation over the macula was quite small.

The commonest site of this type of hemorrhage is the macular region. The breach in the vessel which admits of the passage of blood need not be here, and very often the source of seepage is much higher; but the blood, trickling downward to the posterior pole, finds at this point the least amount of adhesion between the retina and the vitreous body (Beard).

Rarely does the hemorrhage reach the temporal border of the disc, although Haab has seen cases in which a portion of the nerve head was covered. More than one mass of blood may be present in the eye at one time, and Cruise has found three hemorrhages simultaneously, in one eye, one small hemorrhage being on the optic disc, and accompanying two large subhyaloid ones.

The condition appears suddenly in an apparently normal eye, without premonitory symptoms. Trauma and the numerous other causes for hemorrhage, both systemic and local, are responsible for such effusions. Among these causes may be mentioned the cardiovasculorenal types; tuberculosis and syphilis; focal infections; hyperthyroidism; disease of the adrenals; lysis of the intercellular cement substance due to a soluble protein toxin given off in infection, menstrual disorders, and calcium deficiency. Vision, which appears reddish, brown, or gray-green, is at once greatly reduced even to the point of light perception. The blood spreads equally in all directions, forming a thin circular layer, which may however assume a number of different shapes.

The usual ophthalmoscopic picture is that of a large, dark-red or even brownish mass, rounded or somewhat oval in outline, with its superior limits hazily defined and its inferior border strongly marked in contrast with the surrounding retina. At times the contour of the area is semilunar, and it may even be bottle-shaped or wedge-shaped. A long roll-like form has been described, overlying the sweep of a retinal vessel. These latter odd-shaped variations seem to me to have been hemorrhagic remnants which persisted after the greater portion of the original masses had been absorbed. Such a picture is

seen in figure 3 of the color frontispiece accompanying this issue of the American Journal of Ophthalmology.

Both Fuchs and Fox describe the separation of a preretinal mass of blood into two parts; a pale upper and a dark lower one, in sharp contrast with each other. This division is caused by settling of the corpuscles to the bottom of the still fluid blood. The line of contrast formed is straight and horizontal, and may be maintained upon inclination of the head (Masselon). In rare cases this edge shows a concavity; but again it may be convex.

The recognition of this condition is not difficult; nor is its differentiation from other intraocular bleedings. Diagnosis depends upon the baggy appearance of the mass with its light upper and dark lower portions, upon the sudden onset, upon the extremely low and discolored vision; and upon the concealment of the retinal vessels. Definite circumscription of the hemorrhage is to be noted.

A very favorable prognosis can be given, and full recovery of sight often occurs. Should there be a break into the vitreous, however, this favorable termination cannot be expected. Again, the possibility of retinitis proliferans following upon an unabsorbed hemorrhage must be borne in mind.

Treatment is simple. Complete rest is most important and is supplemented by the administration of diuretics, cholagogues, and diaphoretics. Mercury and the iodides are very useful.

Recently I saw a young white male aged twenty-three years, who struck the left temporal region of his head on a submerged rocky ledge, while diving in shallow water. Some fifteen minutes later he noticed a grayish-green scotoma in the line of sight of the right eye; and the vision of this eye later became generally obscured. Vision was limited to light perception.

The day following the accident he consulted the late Dr. James Moores Ball, who made the diagnosis of subhyaloid hemorrhage and referred the man to me for observation. I made three studies in oil of the condition and outlined the scotoma.

Drawings were made on the first, fourth, seventh, and fifteenth days after the accident, and scotomata were charted on the fourth and seventh days.

The man made an uneventful recovery. Four weeks after the occurrence vision had risen to 20/19, with no trace of the hemorrhages within the eye. He was seen again recently, about two and one-half years after the accident; and he had then 20/12 and a normal fundus as seen under homatropin dilatation.

Description of the drawings

First drawing (figure 2 of color frontispiece): In this picture, made the day following the injury, a large, dark-red, oval mass, about three by five disc diameters in size, is seen covering the macular region, involving or obscuring the course of the superior temporal artery and a branch of the inferior temporal vein. The surface of it can be seen best with a +3.00 lens above and a +6.00 lens below. Superiorly the limit of the mass is not clearly defined and it fades out into the retina. The inferior border is convex, showing a sharp contrast with the retina, and here the mass has assumed a characteristic bag-like appearance. There is a smaller pendant portion below this. A thin grayish membrane, white in places, can be seen, which apparently limits the hemorrhage anteriorly at this point. This I take to be the internal limiting membrane. There is no separation into an upper and a lower mass as described by Fuchs and Fox; nor was such evident at a later period. Bleeding was from either of the above named vessels. Just below the disc a small irregular area of blood conceals portions of three vessels (two veins and an artery).

Second drawing (figure 3 of color frontispiece): In this drawing total absorption of the blood is shown as practically completed after fifteen days. Remnants remain here and there. Inferiorly, where the mass was thickest, a well formed clot still persists, and two very pale and small places still show

above. Those below the disc have decreased in size. At no time were changes seen in the disc itself, and one month after the accident the entire retina was again clear.

Metropolitan building.

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LESIONS OF THE CHIASMAL REGION

CLIFFORD B. WALKER, M.D.
LOS ANGELES

The anatomy of the chiasmal region is reviewed. The pathological conditions discussed include aneurisms, gliomas, craniopharyngeal pouch tumors, other types of suprasellar tumor, the hypothalamic syndrome, the hypopituitary syndrome, hyperpituitarism as manifested in gigantism or acromegaly, the transitional conditions grouped under the name of dyspituitarism, apituitarism, meningioma (especially of the olfactory groove), and orbito-ethmoidal osteoma. Read before the Oto-Ophthalmological Society, July, 1929.

With respect to surrounding forces the sella turcica is located somewhat like the rostrum of a wheat pit, subject at times to bombardment from any side and, even worse, from within, above, or below. Furthermore, it likewise plays a prominent part in the control of vital economy, for good or evil, throughout the constitutional realm.

This region was early recognized as a cross roads of importance, and, by the year 1000 of our era, Avicenna had named the ruddy hypophysis the "rose hip." Vesalius later conceived this same body as being secretory and excretory of a substance called pituita or phlegm. It continued to be considered a drainage mechanism until in 1642 the physician Schneider, of "Schneiderian" membrane fame, devoted five volumes to philosophical and physiological argument against this catarrhal theory and apparently won his case for all time.

While it would appear that hardly any other region has received attention from so many special branches of medicine, ranging through anatomist, neurologist, chemist, endocrinologist, psychiatrist, and internist, the chiasmal region has long been of especial interest to the ophthalmologist. Yet because of the difficulty of exposing this region at autopsy without disturbing the exact relations of bone, gland, nerve, meninges, and blood vessels, we seem even in these last few years to be adding to our knowledge and correcting many earlier misstatements about this region, as pointed out by Traquair[20], Fisher[10], and especially with reference to variations by de Schweinitz[17].

With the hope of rendering these relationships more readily visualizable I have made composite diagrams in the vertical and horizontal planes, assembled from various sources and with the personal advice of Professor Harvey Cushing. (Figures 1 and 2). By reference to such drawings it becomes much easier to describe the principal points of practical value. Consider, for instance, that important little structure, the diaphragm, which offers a very convenient starting point in the discussion of this region.

The diaphragma sellæ is formed, like a miniature falx cerebri, by reduplication of the dura to enclose a peripheral venous sinus, as the dura stretches across the sella from its anterior adherence to the tuberculum sellæ just below the sulcus chiasmæ to the posterior clinoid processes and thence downward over the dorsum sellæ. The perforation of the diaphragma sellæ for passage of the stalk of the hypophysis varies in size and eccentricity from a diameter equal to that of the stalk to a patency equal to the inner diameter of the peripheral annular sinus above mentioned.

From the diaphragm downward the dura encapsulates the hypophysis completely. The leptomeninges and cerebrospinal fluid follow the dura around, lining the space between dura and hypophysis in the usual order, so that a removal of hypophyseal adenoma transphenoidally must open all three meninges and must penetrate into the cerebrospinal fluid, which normally bathes the hypophysis but which in case of adenoma is so choked

off by swelling and adhesions that a cerebrospinal leak or a meningitis following the operation is unusual. Of course meninges are opened in the frontal operation also, but this route can be made much more sterile, so that although the operation is more formidable the mortality is five or six per cent less.

Chiasmal variation with respect to the diaphragm both vertically and anteroposteriorly has been shown by Schaeffer to be quite remarkable. When examined under the strictest precautions of fixation and removal, the chiasm was found to fit in close relationship with the chiasmal sulcus in only five per cent of the cases, while in four per cent the chiasm was located entirely behind the diaphragm, resting on the posterior sella. In twelve per cent the chiasm covered the central portion of the diaphragm, while in seventy-nine per cent the chiasm covered only the posterior half of the diaphragm, with the posterior part of the chiasm projecting variously over the dorsum sellæ.

Another variation of surgical and ophthalmological importance is the distance between the chiasm and the diaphragma sellæ, which varies from contact to an interval of ten millimeters, with an average of five millimeters, so that the hypophysis often has to double or treble in size before exerting any marked pressure on the chiasm. This variation is dependent upon the relative height of the presphenoid, the depth of the sella, and the height of the brain stem over the dorsum sellæ.

The circle of Willis, formed by the anterior communicating and cerebral arteries and by both posterior communicating and cerebral arteries, surrounds the chiasm in a distorted circular manner, passing over the "toes", or the optic nerve junction of the chiasm, and under the "heels", or the beginning of the optic tract. (Figure 1.) About one-third of the dissections made by de Schweinitz and Schaeffer showed important variations of the posterior communicating arteries. These may be very large and tortuous, wedging a knee between the chiasm and the hypophysis so as to affect one optic tract in case of pituitary enlargement. The anterior cerebrals also vary toward large tortuous sizes, and in like manner wedge a knee between optic nerve chiasm or tract and a tumor growth. Of course the whole circle of Willis may act as a constricting band, making deep indentations as swelling comes on.

Aneurisms of the basal vessels of the brain are commonly thought of as of rare occurrence, yet autopsy statistics gathered from the literature by Pfingst and Spurling show from one to two per cent in series ranging from 800 to 5,432 cases. When these aneurisms do occur, about one-half of them are in the chiasmal region, according to Gower's study of 154 cases (quoted by Pfingst and Spurling[16]), lying close to or in some part of the circle of Willis.

Many of this latter group have quite definite syndromes, for instance an aneurism of the upper end of the internal carotid may give (1) mechanical pressure effects on neighboring structures, or (2) the more diffuse and sudden effects of rupture or leakage. In more than one-half the cases of cerebral aneurism with ocular manifestations, autopsy showed that rupture or leakage had occurred. Rupture usually produces abrupt pain in the head and the back of the neck and radiating downward, some dizziness, stertorous breathing, and paralysis or irritation of one or more cranial nerves from the first to the eighth, particularly the third, fourth, and sixth, and at times one or more branches of the fifth.

The anatomical relations of the third, fourth, fifth, and sixth nerves in the region of the chiasm should be kept in mind not only in this connection but also in tumor cases.

After the exit of the third nerves in front of the pons inside the crura, they diverge and part between the posterior cerebral and the superior cerebellar arteries (figure 2), and then, rather loosely held in arachnoidal mesh and

cerebrospinal fluid, and passing by the sella at about the level of the posterior clinoid processes, they proceed in close relation to the internal carotid sometimes for a distance of twelve millimeters in their course to the sphenoid fissure.

The fourth nerve, being the only one in this group to decussate, originates

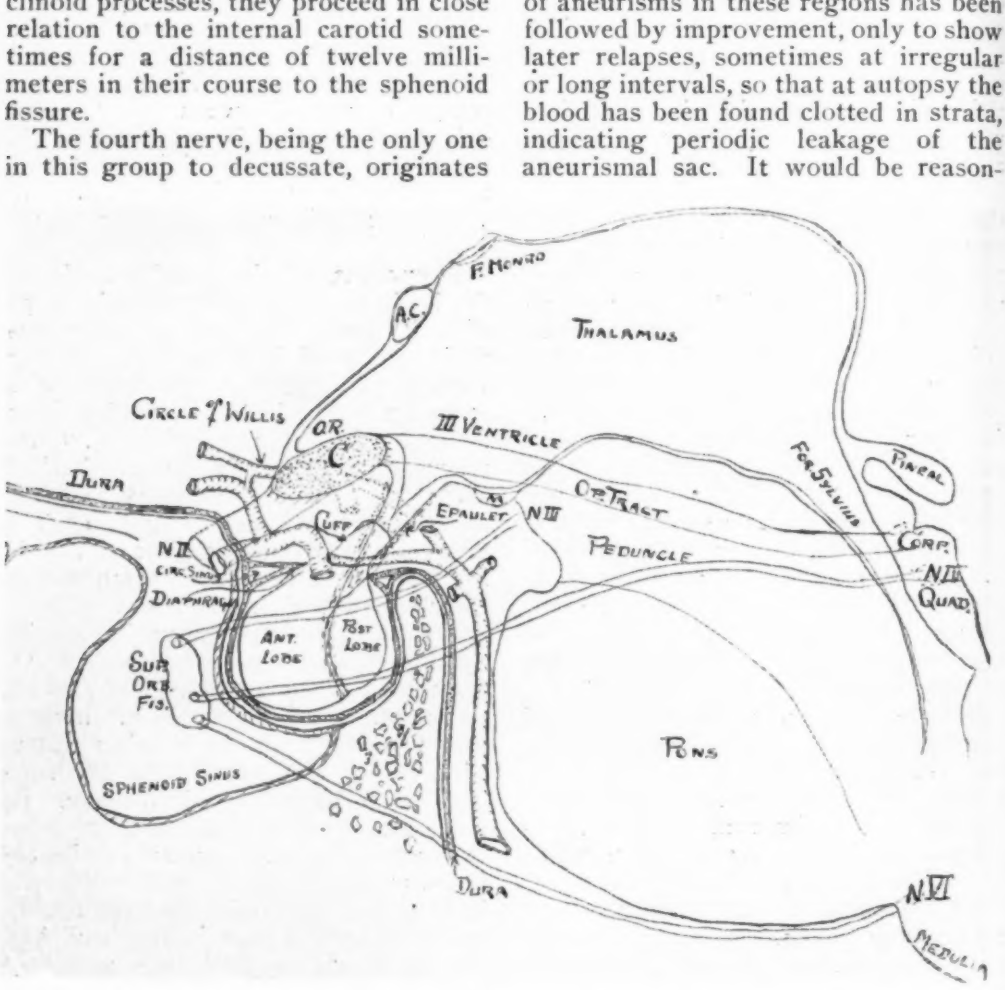

Fig. 1 (Walker). Sagittal schematic drawing through hypophyseal region.

from the region beneath the opposite corpora quadrigemina and swings around the peduncle not far from the optic tracts, but, as it comes toward the third nerve to enter the sphenoid fissure, it is lower and farther out in part of its course, lying between the carotid and the cavernous sinus.

The sixth nerve runs a still longer course (figure 2) and is quite near the midline and the floor of the cranium, and on this account it is often disturbed quite readily by hydrostatic or distant pressure, so that its diagnostic importance is in general not so well defined as that of the third nerve.

Not infrequently rupture or leakage of aneurisms in these regions has been followed by improvement, only to show later relapses, sometimes at irregular or long intervals, so that at autopsy the blood has been found clotted in strata, indicating periodic leakage of the aneurismal sac. It would be reasonable to assume that this recurrent leakage of an aneurism able to affect branches of the fifth as well as some or all of the third, fourth, or sixth nerves could give both pain and migraine together with more or less ophthalmoplegia, and so account for many of the "migraine palsies".

Blood in the spinal fluid is a most important finding in these cases, and it should be looked for carefully a day or two after an attack, since obviously it furnishes an important diagnostic sign which, in association with a negative Koenig and absence of pyrexia, may

differentiate these cases from true meningitis, and further, with careful perimetry, from the tumor syndromes in this region. Calcification sometimes takes place in the aneurism wall, so that the very best x-ray technique should be used in the search for such tell-tale signs.

Thus far this discussion has been mostly with the view of presenting anatomical relations having a practical

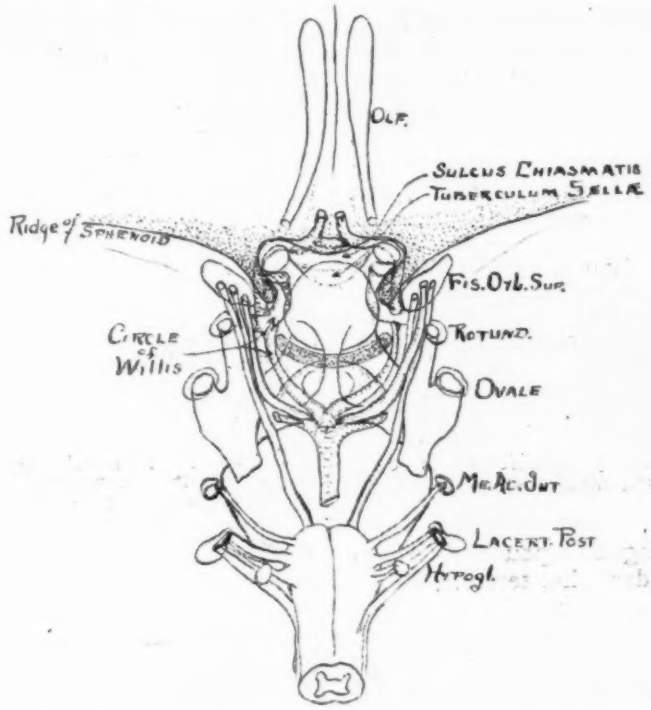

Fig. 2 (Walker). Horizontal schematic drawing through sella to show relation of nerve, artery, and bone in hypophyseal region.

diagnostic or surgical value. Although some abnormal conditions have already been mentioned, the emphasis may now lean more definitely toward pathological considerations.

Primary gliomas of the chiasm are quite easily confused with suprasellar tumors, principally of their origin in the craniopharyngeal pouch. If hypophyseal tumors of all types are included, then, of Cushing's series of 233 verified tumors affecting the chiasm by direct pressure in this region, about three per cent are chiasmal glioma, while if pituitary adenomata are excluded, reducing the number to sixty-one cases, the percentage of glioma rises to eight. In a splendid study of the histopathology of this group, Verhoeff[21] has emphasized that the primary intraneural tumors of the nerve previously reported in the literature as myxomas, myxogliomas, or myxosarcomas are probably all gliomas. He describes "cystoid bodies", globules and rods of hyalin, not infrequently found in glioma elsewhere and considered as originating from masses of neuroglia.

Gliomas are of course not restricted to the intraneural portion of the chiasm but may originate from the immediate neighborhood, for instance from the perforated space, the floor of the third ventricle, the infundibulum, or even the posterior lobe of the hypophysis. But these tumors, Cushing[19] states, do not tend to invade the chiasm, and they produce choked disc rather than primary optic atrophy. He further points out that chiasmal glioma has a tend-

ency to produce bitemporal field distortions and to excavate the optic canals, giving a more or less pear-shaped sella in the x-ray, with the small end of the pear extending forward into the optic canals. However, it must be noted that a similar picture may be found also in Mongolian idiocy and occasionally unassociated with optic atrophy, evidently having nothing to do with abnormalities of the pituitary body.

A table of differential diagnosis from this same article of Cushing's may serve well as a transition to the next phase of our discussion.

Rathke's pouch tumors	Chiasmal tumors
Primary optic atrophy. In late stages, owing to hydrocephalus, edema may be superimposed.	Primary optic atrophy occasionally, with tumor involvement of nerve head. Unilateral exophthalmos in advanced cases.
Bitemporal hemianopia, or, if vision lost in one eye, fairly acute vision retained in the seeing half of the other eye.	Acuity low in both eyes, with fields showing less typical hemianopic defects.
Process slow, often remaining stationary for long periods.	Process on the whole more rapid and progressive.
Sella deformed, enlarged, or normal. Posterior clinoids more affected than anterior. Suprasellar shadows common.	Sella in advanced cases shows more extension under anterior clinoids from distention of optic foramina. No suprasellar shadows.
Secondary pituitary manifestations common, with adiposogenital dystrophy and infantilism.	Secondary pituitary manifestations inconspicuous. Cutaneous indications of Recklinghausen's disease to be looked for.

Craniopharyngeal pouch tumors masquerade under other terms, perhaps at first confusing, such as buccal pouch tumors, or suprasellar or interpeduncular cysts. More frequently perhaps they are called Rathke's pouch tumors. These names all recall Rathke's original morphological description of the formation of the anterior and intermediate parts of the hypophysis from pouching up of the anterior end of the stomodeum in the fourth month, extending from the midline spot just back of the septum (where remnants sometimes form a so-called pharyngeal hypophysis) up through the sphenoid partition to the floor of the third ventricle in the region of the tuber cinereum, which at the same time is the upper end of a down pouching of nervous tissues (ependymal and neuroglial cells) to form the infundibulum and the posterior lobe of the hypophysis.

As the upper and lower ends of Rathke's pouch are attenuated and pinched off, the posterior lobe becomes partially embedded in the larger anterior lobe, the pars intermedia intervening and extending upwards to partially surround the solid infundibulum with a cufflike knob called by Tilney the pars tuberalis, while still another scattering of cells extends further upward to form, according to McLean, epaulets on the lower surface of the tuber cinereum.

As a result, this peculiar formation of epithelial cells may be the starting point of congenital tumors anywhere along the intracranial extension of Rathke's pouch. However, they are for the most part suprasellar and cystic, and they occur usually in young people and children. The epithelial cells become keratinized, and calcareous deposits take place in them. These deposits can be detected in about eighty-five per cent of these tumors. They are often referred to as "psammomatous" changes or degenerations, especially when detected in other tumors such as meningiomata and pineal tumors (also certain vascular conditions of the choroid plexus, and aneurisms, as already mentioned).

Indeed, the study of calcification granules often aids materially in the diagnosis. For instance, Cushing states that up to June of this year his entire series of adenomas of the pituitary body, studied by x-ray, had disclosed only one instance of calcification granules. Since the adenomas occur mostly after adolescence, the one group

may be quite clearly set off from the other by age and a very good stereoscopic x-ray pair of plates.

Suprasellar tumors other than Rathke pouch tumors may make up a number about equal to those of pouch origin. They comprise suprasellar endotheliomas or meningiomas, hypophyseal adenomas with normal sella, epidermal cholesteatomas, gliomas of the third ventricle, and those of the chiasm already mentioned.

Tumors in the midline of the suprasellar region usually give bitemporal field defects followed by optic atrophy, but if asymmetrical, they may give various distortions up to and including homonymous hemianopia, and they may show a tendency to change back again to a previous state. Third nerve palsies always indicate a lateral tendency; they are fairly common. On the other hand, bilateral third nerve palsy or a shifting from one side to the other is rare, though either might occur in a gummatous or other exudative meningitis in this region.

An extension of these tumors upward may produce symptoms associated with the tuber cinereum and the floor of the third ventricle, often referred to as hypothalamic symptoms; while pressure downward on the hypophysis and infundibulum may readily produce constitutional evidence of secondary pituitary involvement, which is usually accompanied by more or less distortion of the clinoids and sella as seen by x-ray.

Third ventricle or hypothalamic symptoms[11] are principally from (1) the infundibulum and tuber cinereum, giving adiposity and diabetes insipidus (polyuria and polydypsia)*; while (2) the grey matter (hypothalamic) around the posterior end of the third ventricle and the aqueduct of Sylvius may give hypersomnia.

The following syndromes are possible with the more extensive suprasellar tumors but are more commonly associated with third ventricle tumors, still it is well to keep them in mind for reference at least: (1) extrapyramidal syndrome of bradykinesia and rigidity; (2) thalamic syndrome of central pain and painful hypertonicity, (Magnus-de Kleijn reflexes); (3) Parinaud's syndrome (paralysis of conjugate vertical movements of the eyeballs); (4) Ley's syndrome[13] (hemichorea). Lateral extension may affect the uncinate gyrus close by and give all or part of the uncinate syndrome (olfactory and gustatory symptoms).

As stated above, pressure downward may produce **the hypopituitary syndrome,** including mainly infantilism, adiposogenital dystrophy if infundibular symptoms are involved, hypotrichosis and cutaneous changes, lowered metabolism, sometimes with bitemporal hemianopia and scotomas, or bizarre or homonymous field defects.

(1) **Compression deficiency.** As stated under suprasellar tumors, the above hypophyseal deficiencies may be produced by compression on the hypophysis. In younger people compression by Rathke's pouch tumors may produce "Fröhlich's disease" with cystic and psammomatous change in eighty-five per cent of the cases, and may represent as high as sixteen per cent of the chiasmal tumors. In adults meningioma of the tuberculum sellæ may also produce the hypopituitary syndrome by compression in the later stages.

(2) **Chromophobe adenomas** make up about forty-three per cent of the adenomas of all kinds in this region. They are responsible for the well known "typical" hypophyseal case with enlarged sella and bitemporal hemianopsia, often very symmetrical and characteristic, both as to the upper quadrant peripheral and as to central field failure. Yet bizarre central scotoma and asymmetry, even homonymous tendencies, may occur. Until recent years these tumors were decompressed and partially removed, with great improvement in vision, mostly by the transphenoidal operations of Hirsch and Cushing. At present the frontal

* Whether it is the tuber cinereum itself or only its epaulets of hypophyseal cells that give the diabetes insipidus is still open to question with McLean.[15]

exposure of the chiasmal region is being done more and the transphenoidal operation less. These tumors have very rarely been found in children, and they have almost no tendency to form calcification granules. The constitutional effects, coming on mainly after the sexual and secondary sexual characteristics have been developed, are of course not of the infantile type, but sexual function and the libido may be checked or depressed at whatever stage of development the chromophobe adenoma begins.

(3) **Simmonds' deficiency or disease** is another almost rare member of the hypopituitary group. No tumor is present in this condition, which is caused by an infarct in the vessels of the anterior lobe of the hypophysis, perhaps as the result of an infectious childhood fever. The infarct is followed by cystic degeneration, or ischemic necrosis takes place. Sexual and physical development is arrested, and senescence begins in childhood*, leading to a peculiar form of hypophyseal nanism, the exact reverse of the condition of gigantism. This suggests the possibility of glandular treatment in Simmonds' disease. The sellar x-ray and field configuration are not distorted.

Having surveyed the conditions of hypophyseal deficiency, we may turn to the opposite condition of exaggerated activity.

Hyperpituitarism has been strikingly demonstrated in the laboratory by Evans,[9] who, using rats, found that the intraperitoneal injection of aqueous extracts of anterior lobe produced the characteristics of gigantism. Smith[18] was able to repeat these experiments, and he also demonstrated that rats dwarfed by hypophysectomy could be restored to their normal curve of growth by the use of homoplastic transplants. Thus has it been convincingly shown that the anterior lobe of the hypophysis is responsible for the production of a growth hormone for skeletal and connective tissue structures. These changes in hyperpituitarism are accompanied by visceral splanchnomegalia, and by a hyperplasia, often associated with adenomatous changes, of thyroid, parathyroid, and adrenal cortex.

If hyperpituitarism starts before adolescence, while the epiphyses are still open, gigantism results, whereas if it begins in adult life acromegaly is produced.

Gigantism (chromophile adenoma of preadolescence) up to the present has only been produced in the rat, an animal whose epiphyses never close, and, since the prepared extract has the ability to interrupt the æstrus (thereby providing an indicator of activity), the female rat has commonly been used. As yet an extract which will control deficiency of growth secretion in man has not been perfected, but it seems quite possible for the future.

Clinically the state of hyperpituitarism in childhood, leading to gigantism in human beings, is not well represented, as the adult or acromegalic condition is, but so far as is known both states are invariably associated with a hyperplasia or with an actual adenoma of the chromophilic elements (as contrasted with the chromophobic elements in hypopituitarism), the only difference being the age of onset. In one case in Cushing's series, with onset at thirteen years of age, gigantistic tendencies were associated with enlargement of the sella, and pressure on the chiasm gave bitemporal hemianopia. A transphenoidal operation removed the chromophile adenoma in large part, and restored the vision, but of course had no effect in reducing the gigantism. Previous x-ray therapy had seemed to aggravate the condition and to bring on urgent necessity for operation.

Acromegaly (chromophile adenoma of adults). Since Marie first associated

* Premature old age has been given the name "progeria" by Gifford, in referring to another type of nanism, all forms of which according to Cushing are probably primarily and secondarily of hypophyseal origin.

acromegaly with an enlarged sella turcica, we have learned that the unmistakable syndrome of acromegaly may develop from overactivity of the anterior lobe long before the sella and gland show any noticeable enlargement. Yet in the greater number enlargement does take place, and the visual defect may be quite similar to that found when the adenoma is chromophobic with hypopituitarism present, instead of being chromophilic with hyperpituitarism noticeable.

By the time the gland has become large enough to affect the vision it not infrequently seems to have been more or less worn out or depressed by pressure, so that the secreting state is that of deficiency. We then have the transitional form which is classified under the next head.

Dyspituitarism. This transitional state in which hypopituitarism takes the place of a preexisting hyperpituitarism makes up five to six per cent of the adenomas, and arises from a mixed tumor in which both chromophilic and chromophobic cells are found. In both this group and the acromegalic group operation may be necessary to preserve eyesight, and in the hyperpituitary group more or less extensive removal of the anterior lobe may protect against the overgrowth in its early stages.

Apituitarism may develop if the hypophysis is completely or functionally removed by surgery, by pathological lesion such as tuberculoma as described by Verhoeff, or by infarct or a luetic process. Complete absence or loss of pituitary substance has been credited with producing a syndrome of cachexia hypophyseopriva, in which may occur convulsions, hypothermia, hypopituitarism, cachexia, coma, and ultimate or perhaps sudden death. Yet on the other hand Dandy and Reichert[8] believe that operations on which these conclusions concerning acute cachexia have been based were faulty in technique, judging from their own negative dog experiments; and Smith's results on hypophysectomized young rats confirm the findings of Dandy.

While the danger of acute cachexia may have been considerably exaggerated, there is without doubt a slower form of cachexia due to severe hypophyseal deficiency, which however may be the lesser of two evils in considering the advisability of removal of certain hypophyseal tumors.

While the recent developments in the study of pituitary activity, pathology, and treatment have been strikingly progressive and interesting, yet other additions to our knowledge are more impressive. Consider for instance the contributions of Professor Cushing both as regards the meningiomas and the use of the high frequency current for their complete removal.

Meningiomas of the tuberculum sellæ, like other meningiomata, do not arise from the dura but from arachnoidal cell rests or clusters, and hence are often referred to as tumors of the leptomeninges. Although they become firmly attached to the dura, they do not as a rule cause the reactive hyperostosis near the pituitary fossa that is common in meningiomas in other cranial regions. While they are found in almost any part of the leptomeninges they are more commonly met with where the dura is tightly attached to the skull, and especially along the sinuses. Thus they are found along the falx and the tentorial attachments, along the ridge of the sphenoid bone and the olfactory groove, and on the tuberculum sellæ where the dura attaches and reduplicates to form the diaphragma sellæ and its enclosed annular sinus (figure 1) just below the chiasmal sulcus.

The meningiomas of the basal region are as a rule firmer, have a more lobulated or mulberry-like surface than the softer and smoother-surfaced meningiomas found over the hemispheres. The latter tend also to be much more vascular when near the large sinuses. Moreover, the basal tumors, especially those under consideration in the chiasmal region, are slow-growing and without reactive hyperostosis as compared with many of the meningiomas of the hemispheres. Although hyperostosis does not help in giving the exact

location of basal meningiomas, nevertheless calcification granules often (thirty per cent) produce on the x-ray film tell-tale traces of meningiomas of the tuberculum sellæ.

It is noteworthy that a meningioma of the tuberculum sellæ will grow between the optic nerves and the diaphragm and chiasm, lifting the chiasm, while if the meningioma is just a little farther forward, that is at the posterior end of the olfactory groove, it will press the chiasm and optic nerves downward. In either case pressure deficiency of the pituitary is a very late and infrequent manifestation.

These tumors should be diagnosed quite early from the field defect, which is a combination of bitemporal hemianopia with more or less bizarre additional field distortion from pinching and stretching of the optic nerve at its exit from the optic foramen. At the stage when field defects and optic atrophy are beginning to show, the sella shows no deformation, though in the final, possibly hypopituitary, stage the clinoids may be flattened somewhat. The onset is quite uniformly postadolescent, and so commonly in middle-aged people that Cushing describes the syndrome as "primary optic atrophy and bitemporal field defects in a middle-aged person with a normal sella".

While this short résumé must not be allowed to wander too far from the chiasmal region, still the ophthalmologist must necessarily be interested in at least the striking neoplastic disturbances that may occur in the region immediately anterior, and that may affect the chiasmal region. Only the following will be briefly outlined: the Foster Kennedy syndrome in relation to olfactory groove meningiomas and sphenoid ridge meningiomas; and finally the intracranially complicated type of orbito-ethmoidal osteomas.

Olfactory groove meningiomas may originate from any part of the groove anterior to the chiasmal sulcus to the tip of the crista galli. While it is possible for these tumors to arise exactly in the midline and produce symmetrical anosmia and optic atrophy, the fact is that, although they are usually bilaterally disposed, yet the symptoms are more advanced on one side or the other, generally in the following order: (1) a primary anosmia on one side; (2) homolateral or ipsolateral optic atrophy or failure of vision due to direct pressure on the optic nerve of the same side; (3) complete anosmia as the olfactory bulb on the other side succumbs to increasing pressure from the enlarging tumor; (4) further enlargement giving increased intracranial pressure and contralateral choked disc; and (5) mental symptoms of frontal lobe tumor due to compression and deformation of brain tissue.

This syndrome, well known as the Foster Kennedy syndrome, was originally described not only in connection with frontal lobe tumors but also in relation to certain frontal lobe abscesses.[27] As has been said, meningiomas of the olfactory groove are commonly bilateral, but an occasional unilateral arrangement may be found and may be confused with a close-in sphenoidal ridge meningioma, though in general these latter are more likely to develop frontal or temporal lobe characteristics without provoking the clear-cut Foster Kennedy syndrome.

The olfactory groove meningiomas would doubtless be suspected with the first onset of monocular field defect if tests for unilateral anosmia were as routinely used in rhinological and ophthalmological examinations as they should be. Simple tests with coffee and scented toilet soap will give the necessary clues. But, even more than to the extent of an anosmia and a visual defect, these tumors can invade the field of the ophthalmologist and rhinologist by bulging down into the ethmoid sinuses to bend or break the orbital plate.

Another slow-growing tumor of different origin which may invade these same fields is next mentioned.

Orbito-ethmoidal osteoma. Because of its particular situation this may occasionally imitate clinically, to a considerable extent, an olfactory groove meningioma and give the first stages of

a Foster Kennedy syndrome, namely unilateral anosmia and homolateral visual failure with primary optic atrophy, while the x-ray may show bony thickening somewhat like the hyperostosis occurring beneath a meningioma. The osteomata originate at the suture line where three bony plates join; the roof of the orbit joins with the roof of the ethmoid capsule and with the inner wall of the orbit at the orbito-ethmoidal suture. Whether from injury to this region which many of the patients have experienced, or spontaneously from remains of the cartilaginous anlage previously dormant in this suture, or from both, a bony tumor develops which may invade not only the orbit but also the cranial cavity and at the same time may allow air and mucus from the ethmoid sinus and the nose to form either a mucocele or a pneumocele or both, and to bulge upward from the suture line into the brain. The lining of this cavity may be continuous with that of the sinus through a perforation of the dura; or, in the case of a pneumocele with a very fine membranous connection with the sinus, there may be no distinguishable lining at all; the brain tissue being directly exposed to the air of the pneumocele. (See also Cushing.[1])

To be sure, not all of the osteomata of the orbito-ethmoidal region develope intracranial extensions, and, while those that do not have such extensions may be removed successfully by the ophthalmologist or the rhinologist, yet it must be remembered that, if a fissure or an extension into the cerebral chamber does exist, grave danger of cerebrospinal rhinorrhea and meningitis may attend such procedures. On the other hand, when attacked through a frontal flap operation at the hands of the neurological surgeon, such dangers may be controlled, as Cushing[1] has so carefully shown, by a fascial transplant to reinforce the dural rent that may be produced by removal of the tumor.

In conclusion it must be noted that, although the chiasmal region is perhaps the most prolific producer of tumors of any part of the brain and cranial cavity, yet practically all the patients with these disturbances come in the earlier stages to the ophthalmologist or the rhinologist, or perhaps before that to the general physician. It is hoped that some of these physicians may find assembled here, in compact form, information which may be useful for early diagnosis.

410 Philharmonic Auditorium building.

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RECENT ADVANCES IN OPHTHALMOLOGY

Diagnosis and pathology

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The recent advances discussed relate particularly to the following fields of diagnosis and pathology: biomicroscopy, orbital radiography, radiography of the lacrimal passages, glaucoma, herpes, sympathetic ophthalmia, choroidal melanosis, retinal angiomatosis, trachoma, arteriosclerotic and renal retinitis, fundus photography, and intracranial tumor. Read as part of the instructional course of the American Academy of Ophthalmology and Otolaryngology, Atlantic City, October 25, 1929.

Art is long, time short, and judgment difficult, even as when Hippocrates so expressed himself.

It would be impossible indeed in an address of this length to review fully the recent ophthalmological advances in diagnosis and pathology. The subject has therefore been approached in a general way with an attempt to direct you, as practical clinicians, to certain phases of that progress which seemed to me important.

Within recent years these advances have been dominated by a number of factors, among which improvement in accuracy of diagnostic methods and the application of physics and chemistry to opthalmological problems stand out preeminently. Accuracy in diagnosis has been much assisted by the introduction of the electric ophthalmoscope, the tonometer, the improved perimeter, the slit-lamp, fundus photography, better radiography, gonioscopy, and improved bacteriological and pathological technique. The improvement in equipment, as for example by the binocular ophthalmoscope of Gullstrand and the slit-lamp, has been striking, and this, with the very definite trend of ophthalmology, as well as medicine in general, to enlist the assistance of physics and chemistry, has enabled ophthalmology to progress as definitely as any other branch of medicine.

Only those of you who have examined bedridden cases in light hospital wards can realize fully what a boon the **electric ophthalmoscope** has been. Formerly, assistance was generally necessary, and under the most favorable circumstances fundus examinations were often unsatisfactory. Now, with the electric ophthalmoscope we may examine large numbers of such cases with ease and comfort, which undoubtedly makes for accuracy.

The taking of tension formerly was guesswork at best. The **tonometer** is not an instrument of accuracy as regards the absolute measure of intraocular pressure. Nevertheless as a clinical instrument its use and value are undoubted. The margin of error within which the records of a good instrument lie is much smaller than the margin of error associated with most clinical methods, and the use of the tonometer undoubtedly marks a distinct advance over previous methods.

Likewise, using a **perimeter** with illumination of equal intensity on every point of the arc, with adjustments for accurate placing of the eye at the center of the perimeter system, with fixation devices for eyes suffering from myopia, hyperopia, presbyopia, or central scotoma, with preexposure cards of neutral shades of grey and stimulus cards with backgrounds of the same shades, and with accessories for studying the blind spot and a tangent screen for campimeter determinations of scotoma, must mean the elimination of many unreliable data and will supply us with records which can be relied upon when we make our deductions.

Without doubt the **slit-lamp** has proved itself the most valuable and fruitful of recent advances in aiding ophthalmological diagnosis. It is composed of four essential elements,

(1) the luminous body,
(2) the condenser,

(3) the slit,
(4) the illuminating lens.

and in principle is merely the scientific adaptation of oblique focal illumination. In its application six methods of technique are available, and the efficiency of the instrument in the finer points of diagnosis depends largely on the proper choice and application of those methods of varying and controlling the illumination. The six methods are as follows:

(1) direct illumination,
(2) diffuse illumination,
(3) retroillumination,
(4) the examination of zones of specular reflection,
(5) indirect lateral illumination,
(6) oscillatory illumination.

"Its chief value consists in the opportunity it has provided of observing directly in minute detail, and correlating into one composite picture, processes whose intimate nature had to be inferred before its introduction from the older and cruder methods available to the clinician or referred to the pathologist. In comparison with the histological method of enquiry, the higher magnifications, such as required to reveal cytological structure, are impracticable. This limitation is partly due to mechanical difficulty. The resolution of the finer details of the observed tissue is essentially a function of the numerical aperture of the objective employed in the microscope, and since each increase in the objective magnification implies a decrease of the focal distance, and an accompanying diminution in the available light, extension in this direction as applied to the living subject is obviously limited. More important, the physiological impossibility of keeping the eye at rest during the examination limits the practical magnification to well below fifty diameters. In addition to the limitation of magnification, the contrast effects of differential staining which histology provides are not obtainable. Nevertheless the opportunity is provided of studying changes as they actually occur, unmodified by the artefacts inseparable from histological technique. In comparison with the older methods of clinical examination, the slit-lamp has presented to us pictures with an elaboration of detail hitherto unrealized. It has allowed us to establish a minute and elaborate record of progress, and to determine with certainty and due appreciation those finer points of diagnostic and prognostic importance which formerly could only be made out with difficulty or when they had progressed to a stage at which, measured by its standard, they appear as gross. In addition, structures which owing to their delicacy were not appreciated clinically have been revealed, owing to the differences in their optical properties." (Duke-Elder, p. 84.)

It is not the purpose of this communication to go into the details of slit-lamp technique. This now forms part of the routine examination in most well equipped offices, so that many of you know its wonderful assistance, especially in the early stages of inflammation. Vogt says that, if the slit-lamp had no other value than in providing the opportunity of recognizing sympathetic ophthalmitis at an early date, it would justify its cost and the labor expended in mastering its technique.

The recent demonstration of the practicability of obtaining **x-ray photographs of the apex of the orbit** has added to our opportunities for refinement in diagnosis. The most important application of the method is in the investigation of tumors of the optic nerve and of the retroocular extension of retinoblastoma. The spread of an orbital tumor up the nerve into the cranial cavity, or of a chiasmal tumor through the canal into the orbit, usually involves a thickening of the nerve which may result in an enlargement of the foramen detectable radiographically. The walls of the canal remain intact as long as the neoplasm is surrounded by the nerve sheath, but as soon as the tumor breaks these bounds erosion of the bone is likely to occur. Meningioma and retinoblastoma met with in this region are relatively nonmalignant, but recent studies have suggested that extension upward to the chiasm and even to the optic nerve is

perhaps more frequent than had been supposed.

In the first work on **radiography of the lacrimal passages,** bismuth paste was used as a means of delimiting the structure. The technique has been considerably improved, and now, by the use of lipiodol instead of a paste as an opaque material many advantages such as greater accuracy, easier injection, less disturbance, and easier removal are to be noted. By observation of the state of the passages and exact delimitation of the site and extent of any obstruction, valuable information may be obtained as to the best method of treatment to be employed and adequate control is provided to gauge the efficiency of any drainage operation or the progress of the course of repeated probing.

Recent investigations of the biochemist and embryologist with the aid of the slit-lamp have revolutionized most of the traditional conceptions of the opaque lens. The slit-lamp has made possible the study of cataracts in their earliest stages. New types have been discovered, and the tissue changes minutely described. The formation of an organic change in the lens is essentially a coagulation of the lens proteins and it is believed to be associated with the same factors which cause coagulation of protein in the test tube.

It is stated now that in **glaucoma,** a composite congeries of diseased conditions, rise of tension is not an essential factor, but only one of the more obvious manifestations of a general derangement in the intimate economy of the eye. Thus glaucoma is by no means identical with hypertension of the eyeball. Glaucoma is the disease, and hypertension only one of its symptoms. The central point is the mechanism of maintenance and variation of the physiological intraocular pressure.

We take it that the intraocular fluids are in equilibrium with the capillary blood, that the height of the intraocular pressure is maintained at the level of the hydrostatic pressure in the capillaries, less the difference between the osmotic pressures of the plasma and of the aqueous, and that it is varied by such factors as alter either of these two quantities which increase the volume pressure of the contents of the globe. Further we take it that these changes are compensated within limits of an escape of aqueous humor through the safety valve action of the canal of Schlemn and the other venous exits; but in so far as their mechanism is rendered insufficient or ineffective by pathological changes, so will these alterations in pressure tend to become cumulative and permanent. It is definitely established that high blood pressure is not an essential nor even an important factor in the etiology of glaucoma, though it is certainly true that glaucoma is very frequently associated with disease of the arterial system, usually of a widespread nature—that a glaucomatous eye is "a sick eye in a sick body."

The tendency for the occurrence of acute glaucoma in persons of an emotional temperament has long been recognized, while of recent years a large amount of attention has been devoted to the etiological importance of the part played by the endocrine group of glands and association with the sympathetic nervous system. Glaucoma is regarded as an expression of some such irritating influence from the central nervous system, as a vasoneurosis, or a loss of equilibrium between the glands of internal secretion.

Whatever be the immediate cause, there is no evidence of any mechanism other than vasomotor being called into play. There may be many exciting factors, but in primary glaucoma many considerations—shallowness of the anterior chamber, the evolution of peripheral synechiæ—point to the fact that obstruction to the exit of fluid is a secondary and adjuvant factor in the etiology of the disease, rather than the primary—a consequence rather than a cause. Further, in some cases of glaucoma as demonstrated by the gonioscope the angle of the anterior chamber may be perfectly and entirely free. The etiology of pathological rises in the intraocular pressure, and especially of

glaucoma, includes not one condition but many.

According to Duke-Elder these causes may be divided into the following three classes, involving three equilibria:

(1) Between blood plasma and the intraocular fluids (decrease in the salt content and increase in the alkalinity of the blood, vasodilatation and increase of the permeability of capillaries).

(2) Between the intraocular fluids and the vitreous body (derangement in the intimate economy and the state of turgescence of the vitreous body, probably due primarily to a circulatory derangement).

(3) Between the blood plasma in the choriocapillaris and in the sensory epithelium of the retina. (Probably here again the primary cause in many cases is to be found in the capillaries.) So far as the tension of the eye is concerned, the potential effectivity of either of the first two factors is increased by inadequate facilities for drainage at the canal of Schlemn; in most cases this, in association with an acute vascular crisis, is the immediate cause of acute exacerbations of the disease.

Then again, glaucoma is stated to be in the nature of an edema, with added factors, hormonal, nervous, toxic, or infectious, and early influences of cellular autolysis. According to this view, glaucoma is edema which is an increase in the amount of intercellular fluid, and is therefore the local manifestation of a systemic disease. Edema is now considered to be the result of a change in the permeability of the capillaries. To repeat, the etiology of glaucoma is certainly not singular, but multiple.

The chief cause lies in a derangement of the permeability of the capillary wall, after the latter has been altered by:

(1) angiosclerosis,
(2) instability of the nervous system.

On the other hand we must not shut our eyes to the fact that the glaucoma process cannot be entirely analyzed by means of the modern physicochemical theories. It was because our coarse anatomical ideas had disappointed us, that we looked for more generally somatic causes, and glaucoma was placed on the list of modern constitutional problems. The influences to which intraocular pressure is subject from the side of the general circulation or the vegetative nervous system or the osmotic equivalence processes, and the correlations of internal secretion, are so manifold that any theory which attempts to bring one of these factors forward as the decisive one bears the stamp of imperfection. In seeking the pathogenesis of glaucoma we must return again and again to the tissues of the body.

Halos, so prominently included in the symptoms of glaucoma, may be physiological as well as pathological. Physiologically the phenomenon may be caused by either of the following factors:

(1) The posterior endothelial cells of the cornea, whose action can be easily elicited experimentally, and may occasionally be evident clinically.
(2) The epithelium of the cornea.
(3) The fibrillary structure of the lens, making it function as a radially arranged diffraction grating. This is the origin of the most common and most easily seen physiological halo.

Pathologically the appearance is caused by:

(1) mucus, lacrimal secretion, and blood in the conjunctival sac, especially when mixed with air bubbles; or
(2) an edematous state of the cornea.

Of these the latter is the more important, and occurs typically in states of raised tension. The halos of glaucoma are readily diagnosed from those due to conjunctival secretion, by the disappearance of the latter on winking.

A large amount of work has been expended upon the various manifestations of **herpes** and those diseases with which it is associated. Some years ago the existence of a specific herpes virus

was established. It is an ultramicroscopic nonfilterable organism. When it is transferred to the cornea of the rabbit, it produces a lesion, and the infection travels up the nerves and produces an affection of the central nervous system—herpetic encephalitis.

The virus will travel up to the central nervous system by any nerves which supply the affected area, motor, sensory, or sympathetic. In the case of herpes corneæ, the route is by the first division of the fifth, and the primary central lesion is the bulbospinal root.

Related to herpes simplex is herpes zoster, and symptomatic herpes zoster. The first is an acute epidemic disease caused by a filterable virus, whose focus of infection is probably the gasserian ganglion. The clinical manifestations are different, and the histological lesions are not the same. A certain amount of clinical evidence associates herpes zoster with varicella. There is also a close immunological connection between epidemic herpes zoster and vaccinia, and any of these three may produce a form of encephalitis allied to encephalitis lethargica.

Herpes simplex as it affects the cornea is a local lesion, the most common clinical manifestation of which is a dendritic ulcer. Herpes zoster epidemicus is an acute infection, epidemic in nature, affecting the posterior root ganglia, the nerve fibers originating from these ganglia, and the skin, mucous membrane, and other structures supplied by these nerves. The initial corneal lesion seems usually to be a subepithelial infiltration in the superficial layers of the substantia propria. Accompanying these corneal lesions there may be a marked diminution of sensibility, a local rise of temperature, an iritis or iridocyclitis, a complicated cataract, an increase or decrease in the intraocular tension, or an optic neuritis (which may be followed by atrophy) and a third or seventh nerve paresis.

There are two surviving theories of **sympathetic ophthalmia**; anaphylactic and infective. The anaphylactic, supported by experimental evidence, argues that injury to the exciting eye results in the liberation and general distribution of pigment from the uveal tract, the absorption of which produces a hypersensitivity of the organism as a whole and especially of the homologous organ, the fellow eye. Subsequent absorption results in the anaphylactic intoxication which in the sensitized uveal tissue of the other eye is manifested clinically as sympathetic ophthalmitis. An infective origin is strongly suggested by pathological findings, though the two questions, as to the nature of the hypothetical organism and the route of its entrance, still remain unanswered. It is claimed that if sectioning of the optic nerve be carried far enough pathognomonic lesions of a diffuse or nodular granulomatous infiltration by lymphoid and epithelial cells will be found. This is identical with the lesion which occurs characteristically in the uveal tract, and strongly suggests an infection by direct extension along this route.

The subject of **melanosis** has in the last few years occupied increasing space in the medical literature. The melanotic pigment melanin is now generally regarded as a product of cell metabolism, and the term "melanoma" should be limited to those tumors containing true melanoblasts, that is having the power of forming melanin. There exist in the choroid certain pigmented tumors which are undoubtedly benign growths. The ophthalmic picture is described as follows:

"In size they vary from about one-half the area of the optic disc to about four times its area. They were roughly circular or oval in outline, the edges everywhere quite definite, without being quite hard and sharp; there was no shading off into the surrounding fundus, nor was there any light fringe or evidence of pigmentary disturbance at the edge. They were of quite homogeneous appearance, and the choroidal pattern, although plainly seen around, was not seen over the area of the growths. In color they were exactly that of blue ointment, differing only in their density. All were single and close

to the optic papilla. They were all discovered by chance—none of them having given rise to symptoms. During the time the patients were under observation there was no change in the appearances. There was no abnormal pigmentation of the eyes discoverable on external examination."

While there seems to be very strong evidence that these growths do not become malignant, and are congenital, we do know that there are many instances on record of malignancy of unusual chronicity, so that a knowledge of these conditions and their possibilities is of extreme importance.

The typical picture of **angiomatosis retinæ** or Hippel's disease consists of a pair of hugely enlarged vessels, often emerging from the lower part of the disc to disappear in a small tumor mass in the peripheral retina. The vessels, though of approximately the same color, can be distinguished by the fact that the vein is the larger of the two, whereas the artery is often beaded and of varying caliber. Not infrequently, in course of time, other small tumors may appear in other parts of the retina, with the development of similar pairs of vessels.

The process slowly advances, with the ultimate occurrence of secondary changes in the shape of opacities and infiltrations due to exudative secretion and sometimes to hemorrhage, with the formation of a reactive gliosis, iridocyclitis, detachment of the retina, glaucoma which may necessitate enucleation. These secondary changes, which fall in the category of Coats's proliferative retinitis, ultimately serve to conceal the nature of the primary lesion. Both eyes are likely in time to become involved, and the condition has been found in many cases to be familial.

Though the histologic nature of the underlying lesion remained for a long time obscure, it is now known to be a hemangioblastoma, a form of tumor which exudes plasma and tends to produce cysts having xanthochromic fluid contents. Moreover it has come to be appreciated that coincidental hemangioblastic cysts are not infrequently found in the cerebellum, arising usually from an anlage over the posterior part of the fourth ventricle. Lindau's studies have served to show that these angioblastic lesions of the nervous system are not infrequently found in association with cysts of the kidney, cystic pancreas, hypernephromas, and tumors of the adrenal glands.

Perusal of the literature of the recently held Thirteenth International Ophthalmological Congress brings again vividly to our minds what a universal world scourge **trachoma** is. In 1907 chlamydozoa or trachoma bodies were first described, and for some years subsequently great activity was shown in investigating these forms. Although epithelial cell inclusions are to be found in quite a number of other conditions, they are still closely associated in the minds of many with the etiology of trachoma. They have been variously regarded as nuclear degeneration, as the product of mucous secretion under pathological conditions, as bacteria, or as nests of hemoglobinophilic bacilli.

The opinion has recently been expressed that the inclusion bodies in the epithelial cells originate from rod-shaped microorganisms which tend to occur as diplobacilli, and that the development of the inclusion body after the entrance of the rod into the cytoplasm of the cell is due to multiplication of the organism and subsequent reaction on the part of the cells against the invading bacteria. The reaction transforms them into the small reddish-staining coccoid forms designated as elementary bodies. The blue staining mantle represents the partially dissolved portion of the bacteria.

From the study of trachoma and the trachoma bodies developed the study of the conjunctival epithelial cells, with the result that it is well established that pathogenic conjunctival bacteria, such as the gonococcus, the pneumococcus, the Koch-Weeks bacillus, the diphtheria and influenza bacilli, are parasites of the epithelial cells. It has been established that the diplobacillus is also of this character. The bacteria proliferate on the surface of the cell and draw

nutriment from it. As they penetrate the deeper layers, one finds cell proliferation and reaction. The older epithelial cells are cast off and the younger ones phagocytose the bacteria.

In 1927 Noguchi, while working on the etiology of trachoma, isolated a small gram-negative bacillus from cases of trachoma among the American Indians. The microorganism is similar in morphology to the bacillus xerosis, but differs from it in being gram-negative and negative to growth on plain agar and broth at any temperature. A more striking difference is that the Noguchi bacillus is motile. It moves by a single flagellum which arises usually from one of the poles, but occasionally appears as if attached to one side. These properties definitely exclude this bacillus from the diphtheroid group so frequently found in the normal and inflamed conjunctiva. When injected into the conjunctiva of the macacus rhesus monkey, this microorganism sets up a granular conjunctivitis with scarring, which grossly and microscopically resembles trachoma in man.

While the clinical signs of a gonorrheal ophthalmia are well established at the end of the third or fourth day, examination of the discharge may show a few gonococci, but more likely no microorganisms will be found. If a smear is prepared so that the epithelial cells may be examined, gonococci in large numbers will be found within the cytoplasm of the cells; that is, the new or young epithelial cells phagocytose the bacteria. This process of phagocytosis probably lasts until all the microorganisms have been disposed of, and in gonorrheal infections this may take weeks. Study of the trachoma bodies developed the epithelial cell smear, a very definite step forward in conjunctival bacteriological technique.

The extreme view has been put forward that **arteriosclerotic and renal retinitis** are indistinguishable, the appearance of the hemorrhages, of the white patches, and of the changes at the disc in the former differing from those in the latter only in being the result of a slower and less concentrated action of the poisons in the blood. It is held that in some cases of arteriosclerosis a distinctive form of retinitis develops which is due primarily to local impairment of the capillary endothelium from its deficient blood supply, and that this type can be distinguished ophthalmoscopically and carries with it a better prognosis than renal retinitis.

Doubt is expressed as to whether a retinitis due to **diabetes** alone ever occurs. Certainly, in cases where retinal disturbances complicate this disease, albumin, as well as high blood pressure, usually complicates the clinical picture, while in young subjects in whom the toxic elements are manifested in their most malignant form retinitis does not occur. On the other hand it is contended that there are features, such as the appearance and location of waxy looking exudates, circular hemorrhages, absence of a star figure and of cotton-wool patches and pigment spots in the later stages, which form a picture which is characteristic to such a degree as to enable one in some cases to say with assurance that the condition is due to diabetes.

Interest in **fundus photography** is steadily increasing. A photograph shows the definite condition present at the time of examination. More detail is secured and made part of a permanent record by this method than by any other which has ever been devised. For determination of progression or retrogression of retinal lesions, photographs are incomparable. By this method vascular changes may be diagnosed, and a more accurate prognosis can be given if a serial photographic study is made.

Since in 1894 Warren Tay described certain white dots in the fundus at the foveal region, many reports of somewhat similar conditions have appeared. The descriptions are confusing and the titles misleading. By using the **Gullstrand ophthalmoscope** the depth of individual lesions may be appreciated. With stereophotographs we are able to show diseases and to study the particular level of involvements. The deposits so well described by Tay remain

clinical entities. The shining dots of Gunn have not been verified in front of the retinal vessels. The association of hyaline deposits with other diseases has not been sufficiently emphasized. Only by stereoscopic examination or by stereophotographs is it possible in the mooted cases to definitely decide the location of the lesion.

It lies within the memory of most of us when the recognition of an **intracranial tumor** rested on the triad of headache, vomiting, and choked disc. Tumors were supposed to be rare, and, when on the basis of these so-called cardinal symptoms one was suspected, surgical intervention was likely to be postponed until vision was seriously impaired. The past quarter of a century has seen a greater revolution in all this than is generally appreciated. The methods of tumor localization have been vastly improved, the technique of the surgical procedure has been completely transformed, and the microscopic differentiation of the many varieties of tumor, all of which vary in their life history, in their behavior, and consequently in their prognosis, will soon be put on a sound basis.

It is not only essential that the presence of a tumor and its precise location be reasonably assured before it is attacked, but it should be possible to make at least a presumptive guess as to its histological nature and the likelihood of recurrence, for these things will greatly influence the surgical procedure. The goal in short is to recognize the peculiar manifestations of a particular kind of tumor in a particular region at the earliest possible stage of the process, in order that an operation may be undertaken under the most favorable auspices.

Meningiomas (which name has been substituted for the unfortunate misnomer "dural endothelioma") represent about twelve percent of all intracranial tumors. They differ considerably in their gross appearance as well as in their microscopic structure and rapidity of growth. Nevertheless they are all akin. They have favorite seats of origin, in each of which they show differences of behavior that provoke a recognizable train of symptoms which is strikingly similar from case to case.

For example, the combination of unilateral exophthalmos with marked hyperostosis of the lateral wall of the orbit and temporal fossa is almost invariably associated with a peculiar flat tumor, meningioma "en plaque", that spreads over the meninges covering the anterior and lower part of the temporal lobe, without producing any intracranial symptoms whatsoever. Certain other meningiomas which we should be quick to recognize take their origin from the basilar leptomeninges in the vicinity of the pituitary fossa. Some arise from the olfactory groove; others with equally unmistakable manifestations arise from the sphenoidal ridge lateral to the sella turcica, and implicate the adjacent optic and oculomotor nerves; and still others may actually arise from the meningeal expansions which constitute the sheath of the optic nerve within the cavity of the orbit.

The dural endothelioma is now known to most neuropathologists as meningiofibroblastoma. The name "dural endothelioma" was originally used for the reason that this tumor was thought to arise from endothelial cells. Even now the exact origin of the tumor is not perfectly clear. By some it is thought to be more closely related to the fibroblast than to the endothelial cell. Yet some writers think that it arises from the cells which line the arachnoid spaces. Until the exact relation of these tumor cells to normal cell types is proved, an exact nomenclature for the tumor is not possible. The characteristic microscopical finding in the so-called dural endothelioma is a whorl-like arrangement of the tumor cells. In the eye these tumors arise from the normal reflection of the meninges on to the optic nerve, and they correspond in all their details to the tumors arising from the meninges of the brain itself.

As suprasellar meningiomas from the tuberculum sellæ in the course of their growth separate the optic nerves and become straddled by the elevated and flattened chiasm, they are of special

interest to ophthalmologists. They sound an early alarm because of their position, and they may consequently be recognized and operated on more promptly than would a meningioma of comparable size in any other situation, unless possibly in the spinal canal.

The meningiomas that arise from the basilar leptomeninges in the vicinity of the pituitary fossa do not as a rule cause the reactive hyperostosis which so often makes it possible to determine the exact point of origin of meningiomas elsewhere in the cranial chamber. They are consequently more difficult to recognize and localize precisely, and, if they are to be picked up at a stage when they are easily removable, this can be accomplished only by full knowledge of the symptom complex they produce.

It is the fact that these tumors are prone to cause primary optic atrophy that lends them an especial importance for ophthalmologists. Some of them arise from the sphenoidal ridge lateral to the sella, press against the adjacent optic nerve, and finally implicate the chiasm, causing a homonymous hemianopsia. Others arise from the olfactory groove and provoke a characteristic chronology of symptoms beginning with unilateral anosmia, followed by an isolateral optic atrophy, and ultimately by a choked disc in the contralateral eye. This combination of signs and symptoms known as the Foster Kennedy syndrome is unmistakable, though the olfactory groove tumors may reach an enormous size before their presence is suspected.

In the group of meningiomas which arise from the arachnoid over the tuberculum sellæ, the ophthalmological symptoms are produced while the lesion is still small and easily removable. In the progress of their growth these mesially placed tumors separate the optic nerves, elevate the chiasm, and ultimately lead to blindness; as well as to absorption of the sella, and to hypopituitary, hypothalamic, uncinate, and general compression symptoms. But in the stage in which they are favorable for operation they are associated with a characteristic syndrome whose essential elements are as follows:

(1) They occur in patients of middle age.

(2) Impairment of vision is the earliest, usually the only symptom complained of. The fields become bitemporally constricted, though as a rule the process does not advance with equal steps in the two eyes.

(3) A primary optic atrophy is invariably disclosed by the ophthalmoscope.

(4) At the stage at which they are favorable for operation, the tumors do not deform the sella turcica nor cause secondary symptoms of hypopituitarism. This fact renders them distinguishable from the general run of hypophyseal adenomas which also cause bitemporal hemianopsia and primary atrophy, but which usually arise within and distend the sella.

In conclusion I can only refer you to the immense research opened up by study of the ultramicroscopic viruses, and the work on the herpes virus especially as related to sympathetic ophthalmia. Our knowledge of the intimate anatomy of the visual tracts from the retina to the primary visual centers has been considerably increased. The work of retinal capillaries, closure of the central artery, ultramicroscopic studies of the vitreous, study of the aqueous humour, the nature of the intraocular fluids, experimental production of lesions resembling phlyctenules, the production of fatty infiltration of the cornea resembling arcus senilis, the elucidation of the condition of the anterior chamber in glaucoma, moving pictures in investigative and teaching work, the different kinds of eye pigments as shown by tissue cultures, experimental tuberculosis of the retina, the fungi and higher bacteria in their relation to diseases of the eye and its adnexa, as well as the ocular mycoses, are all worthy of your careful study.

In the matter of diagnosis, Kennedy's scotoma in frontal floor tumors should be emphasized. Cushing's syndrome in temporal lobe tumors, quadrant anopsia, scotoma in choked disc,

new ideas on central scotoma, typical finger scotoma differing from the central scotoma of other conditions, enlarged blind spot and moderate contractions of the field of vision, the newer conceptions of toxic amblyopia, headache and eye disorders of nasal origin, the diverse opinions on squint amblyopia, and retinal degeneration in the macular region, are only a few of the subjects which might be enlarged upon did time permit. These, I am sure, would lead us further to topics of equal interest and importance. While much has been done, there is alas still much to do. "Achievement is but another milestone along the highway of progress—the end of the journey lies ever beyond."

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Note: Very free use has been made of Duke-Elder's book and of the article by Cushing and Eisenhardt.

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THE EXTRACTION OF SENILE CATARACT IN THE CAPSULE

by the method of Stanculeanu-Török-Elschnig

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Translation (partly summarized) by Harvey D. Lamb, M.D.
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Because of the rapidly increasing interest in intracapsular extraction by one method or another, it seems worth while to reproduce here, in condensed form, this exposition of a technique of intracapsular extraction with forceps which is fairly popular in central Europe. This operation is more difficult to teach and to learn than the extracapsular method, since the essential manipulations depend particularly upon the sense of touch. It has the advantage over the methods of Smith and Barraquer that when occasion arises it may be completed extracapsularly, although in certain cases such a contingency is accompanied by special difficulty.

The removal of cataract together with its capsule was considered as a goal worth striving for ever since man undertook to remove cataract by extraction. Pagenstecher was the first to employ on a large scale the extraction of cataract with the capsule. H. Smith systematically used for over twenty-five years on the colossal material of India the method of intracapsular expression of cataract advocated by Mulroney. Outside of India, on account of its danger, this method has hardly been employed, and where it was tried was abandoned in favor of other intracapsular methods. The danger of the loss of vitreous and of iris prolapse by this method is so great that the possibility of obtaining a round pupil has to be for the most part abandoned.

Much greater interest was shown in Barraquer's method of withdrawal of the lens with its capsule by means of a special suction apparatus. This procedure has especially found favor in Spain and South America. We here were skeptical toward the intracapsular method in general, and could not decide to give up the established method of extracting the cataract from the capsule with the assistance of the capsule forceps until I had the opportunity of seeing Elschnig execute his method. The latter procedure appeared to me far less dangerous than the earlier methods, beside presenting definite advantages over the extracapsular operation.

This method, used by Elschnig since 1927, goes back to Stanculeanu (1911), who seized the lens capsule with smooth forceps and by lateral movements loosened the lens from the zonule. After releasing the capsule, the subluxated lens was massaged out of the eye with two spatulas. Similar procedures of loosening the lens with a capsule forceps, with subsequent or simultaneous extraction by pressure, have been advocated by Simpson, Knapp, Sinclair, Verhoeff, and others.

Török improved on the procedure of Stanculeanu in that, instead of laying aside the capsule forceps, he utilized them to extract the lens in its capsule with the aid of simultaneous pressure by means of a spoon held against the inferior corneal margin. This method thus combines extraction and expression.

Elschnig has retained this combined management, and has modified it by very important preparatory measures (akinesia, control suture, retrobulbar injection, preliminary wound suture) which still further diminish the dangers of the operation.

The following is a report concerning the cases operated upon by me in the course of the first year (April, 1928, to April, 1929) according to this method (later somewhat modified).

Preliminary general examination should never be neglected, paying especial attention to the possibility of dia-

* Zeitschrift für Augenheilkunde, 1929, v. 69, p. 147.

betes and of diseases of the vascular system. Where high blood pressure exists a considerable blood-letting is done ten or fifteen minutes before the operation, and quieting of the patient by psychic influence and by large doses of bromide is very important. In diabetes extraction of the cataract in the capsule is preferable, since the danger of post-operative iridocyclitis or infection seems to be materially diminished.

(The usual precautions as to inflammation of the upper air passages, and as to the condition of the conjunctival sac and the tear-passages, are discussed by the author).

For intracapsular extraction with round pupil it is requisite that the pupil shall dilate sufficiently. In each case this is tested by instillation of one percent homatropin solution the evening before the operation. If next morning the pupil is still wide and fixed, no more homatropin is used. If the pupil has again become narrow, homatropin is again instilled two or three hours before the operation. If the pupil has not dilated more than five millimeters to the homatropin, intracapsular removal of the lens through a round pupil is difficult, and it becomes advisable either to precede extraction with a complete iridectomy or to deliver the lens extracapsularly. The attempt to obtain a wider dilatation in such cases with atropin does not appear wise, since after the extraction it may be difficult to make the pupil again narrow, round, and centric with eserin. If one uses homatropin for the first time just before the operation, there is often, when the pupil has become very wide, a certain slackness of the sphincter which does not respond well to subsequent administration of eserin.

Relaxation of the lids by akinesia is of the greatest importance. We use for its accomplishment a four percent novocain solution (about 4 c.c.), infiltrating downward and inward and upward and inward so that one-half of the circumference of the orbital margin is blocked. Care must be taken that the needle stays at least one cm. behind the orbital margin, so as to produce no edema of the eyelids. We use simply a novocain solution without the addition of adrenalin, so as to obtain a transient paralysis of the orbicularis muscle without spastic contracture of the lid elevator, for by the latter the upper lid is raised so high that closure of the eye is hardly possible upon applying the dressing after the operation. It is neither necessary nor good to perform the akinesia more than five to ten minutes before the operation. When one does the injection ten minutes after beginning cocainization there is usually a sufficient interval by the time the eye is irrigated for the full effect of the akinesia. A longer interval is not advisable, since otherwise toward the end of the operation the action may diminish and an unpleasant trembling of the lids may occur.

After irrigation of the eye there follows the retrobulbar injection. It appears sufficient to inject 0.5 cm. of a two percent novocain solution with one or two drops of one to 1,000 suprarenin solution. During the injection it is best for the eye to look down and inward. A fine straight needle is inserted from outward and above, through the conjunctiva of the fornix, to behind the equator of the eyeball. Deeper advancement of the needle is unnecessary and more dangerous to the larger orbital vessels. We prefer injecting from outward and above because the superior rectus muscle is particularly relaxed by the blocking in this location, and the pull on the superior rectus muscle from the control suture also tends to be less painful.

In very nervous and sensitive patients it is advisable, before irrigating the eye, before the retrobulbar injection, and before insertion of the control suture, to instill from above several drops of a twenty percent cocaine solution upon the scleral conjunctiva or to lay on an applicator dipped into cocaine solution of this strength.

The eye becomes softer through the retrobulbar injection, as demonstrated by tonometric measurements in patients with squint. The softening occurs in about five minutes, and one must not

wait too long for the extraction after the retrobulbar injection, or otherwise the eye may become too soft, a very unpleasant condition if the capsule happens to be torn and the lens must be delivered extracapsularly. I would desist from retrobulbar injection in very old asthenic individuals with deepset eyes.

The bridle suture, applied immediately after the retrobulbar injection, appears to us very important in every cataract operation. It is inserted through the tendon of the superior rectus muscle close to its insertion in the sclera. The advantage of having the eyeball thus under control cannot be valued highly enough in deaf patients or those turning their eyes badly. If one puts in the bridle suture it is necessary to insert a Desmarres lid holder under the upper lid, around whose margin the bridle suture is carried. The assistant holds the lid holder and the control-suture with his right hand. With the thumb of the left hand the assistant draws down the lower lid. If the fixation forceps tears out during the incision, the operator at once seizes the bridle suture with his free hand in order to complete the incision.

The incision is carried out with a Graefe knife as in ordinary extraction, although with a larger conjunctival flap. A smaller incision in patients under fifty years or in hypermature cataracts, where the nucleus is usually smaller, does not commend itself in the intracapsular operation, since the capsule may rupture on account of the small incision. The knife should not extend into the cornea nor too far back into the sclera, since in the latter event bleeding may make an accurate execution of the operation very difficult. One must avoid turning the knife backward before dividing the sclera, since the incision otherwise becomes too scleral, which makes the operation unnecessarily difficult through bleeding.

(The author then gives instructions for insertion of a suture in the conjunctival flap, and for basal iridectomy.)

It is better to make the iris opening before the intracapsular extraction, since afterward vitreous lies behind the iris and in the pupil and tends to prolapse in subsequent manipulation of the iris. If hemorrhage into the anterior chamber occurs after the incision or after the iridectomy, the blood is massaged out with gentle pressure from below, best with the lower lid so as to retain a clear field of operation.

There now follows the most important and also the most difficult step of the operation, the delivery of the lens in its capsule.

The blunt capsule forceps—we use Elschnig's model—is inserted far enough for the blunt ends to be able to seize the capsule in the lower part of the pupil. In grasping the capsule it is advisable—in very soft eyes it is absolutely necessary—at the same time to exert against the globe an opposing pressure with a strabismus hook held below the limbus, since otherwise the lens has a tendency to slip away and to be luxated backward. The capsule forceps is opened two or three millimeters and the capsule seized, which in immature but not swollen cataracts is almost always successful. Now, under somewhat greater counterpressure with the end of the strabismus hook, the lens, grasped by its anterior capsule, is slightly raised with its lower margin forward, so that the lower part of the zonula is first stretched and broken.

Without putting aside the forceps or the strabismus hook, the zonule is next ruptured laterally by movements to right and left, until the lens follows the capsule forceps without resistance. Then the lens, with further elevation of its lower part, is drawn for the first time over the lower pupillary margin forward and upward, followed by pressure with the strabismus hook. In this manner the lens is raised from the plate-shaped depression in the vitreous, and the separation occurs from below upward. Theoretically the lens would have to turn 180 degrees upon its transverse axis, if it were entirely rigid; but it clings to the pupil and the incision in such fashion that it usually comes out deformed, as when one seizes and plucks an overripe fig.

The zonular fibers tend to rupture last above, often only upon delivery through the wound. It may happen that these last zonular fibers exert an especial resistance, and a small piece of capsule with adherent cortex frequently remains behind, an event of no especial significance. After an entirely smooth delivery in the capsule one may often see with the slit-lamp a fine membrane in the upper part of the pupil, which perhaps corresponds to these remnants of zonular lamella.

After smooth intracapsular delivery of the lens, there follows at once tying of the previously placed suture, and then reposition of the iris. The spatula should always remain in front of the iris, without getting into the pupillary region or the coloboma, so as not to injure the limiting membrane of the vitreous. The control suture is removed, the upper lid drawn cautiously downward over the eye, one percent eserin instilled, one percent eserin ointment introduced, the eye closed and dressed in the usual way.

The operated eye is dressed daily for six or seven days. When the pupil is very narrow it is advisable to obtain moderate dilatation by occasional cocaine or homatropin administration. Atropin is rarely necessary, on account of the usual absence of irritation of the iris.

Extraction of the lens in the intact capsule is easiest in the immature cataract of older individuals before the lenses have become intumescent, and next in mature or almost mature cataracts. In the greatly swollen lens the capsule is not easily seized with the blunt forceps, being under excessive tension, and the capsule tears either on seizing or during delivery, or it must be opened with the toothed capsule-forceps. In hypermature cataracts the capsule is frequently thickened and the underlying cortex much softened, so that the capsule slips away on attempting to grasp it with the blunt forceps. Then it must either be grasped with a special capsule-forceps furnished with wave-like ends so as to make intracapsular extraction possible, or with the ordinary toothed forceps the usual extracapsular extraction is performed.

The cataracts of younger individuals are not as a rule suitable for the intracapsular method. The zonule is too resistant and the capsule usually ruptures, so that the often semiluxated lens must be delivered with difficulty and danger, a large part of the capsule frequently being left behind. An exception is the shrunken lens, if the zonule is overstretched and the capsule thickened, so that in such cases, even in youth, the lens can be delivered in the capsule (usually with the ordinary toothed forceps).

Otherwise the form of the cataract is not so important as the age of the patient. We have smoothly delivered, in the intact capsule, perinuclear cataracts, heterochromia cataracts, cataracts in high myopes, and cataracts in the presence of retinitis pigmentosa or iridocyclitis, but as a rule only in older patients. The youngest cataract patients operated with the intracapsular method were forty years old, but the extraction was more difficult on account of the greater resistance of the zonule requiring a better basic loosening of the lens from the zonule by the lateral movements of the extraction. In quite old people and in cataracts with very large nuclei, which become caught against the iris or the wound margins during passage of the lens in its capsule, difficulties may often be encountered.

The complication most feared in the intracapsular cataract operation is loss of vitreous, which may occur in any stage of the operation but by far more rarely than one would expect. One of the most important causes of loss of vitreous is too much pressure of the capsule forceps against the lens: the lens may thereby be luxated backward, whereupon the vitreous comes into the anterior chamber or into the wound. Another important cause for vitreous loss is too much pressure from the strabismus hook below, if the lens has not yet been sufficiently loosened from the zonule with the forceps.

In these cases, if the vitreous presents before the delivery of the lens and the

lens does not follow the pull of the capsule forceps, it must be delivered with a loop after a complete iridectomy. If vitreous presents in the anterior chamber after extraction of the lens, recognizable by the chamber becoming deeper, immediate drawing together of the previously inserted wound suture usually prevents its loss.

Much more frequent, but usually without particular significance, is rupture of the lens capsule. It may occur at different parts of the capsule and in various stages of the operation, from different causes. The most frequent cause is early pull on the lens capsule before the zonule is loosened, and without sufficient opposing pressure; in which case the capsule usually ruptures anteriorly. This may occur with any kind of cataract, but with increasing practise it can be avoided in those forms of cataract adapted to intracapsular extraction. The operation is usually finished extracapsularly.

If, while massaging out lens remains, the preparatory wound suture causes trouble by lens substance sticking to it, it is subsequently removed so that one may more easily stroke out lens remains from the wound.

The capsule may also tear if the nucleus is too large in proportion to the pupil or to the wound and is therefore held back. In such cases with rigid sphincter, recognizable before operation by inadequate capacity of the pupil for dilatation, it is best either to operate extracapsularly or to associate intracapsular extraction with a complete iridectomy.

The capsule may tear because too large a fold of capsule has been seized by opening the forceps too widely, since the remainder of the lens capsule cannot hold the capsular contents, and so stretches and ruptures.

The capsule does not always rupture anteriorly at the place seized, but sometimes behind or equatorially, where the capsule is thinner. In such a case the entire capsule follows the pull of the forceps; but the nucleus and the cortex may remain behind, and must then be massaged out with the greatest caution, since they lie upon the vitreous. If this is not possible on account of the softness of the eye, or if the vitreous presents, delivery must be made with the spoon or loop.

If the capsule be left lying in the wound, it must be pulled out subsequently with forceps. Larger lens remains left in the eye are carefully removed with the spoon. In the after-treatment of these cases, it is better to instill atropin as in the extracapsular operation.

Because immature cataracts that are not swollen offer the best chance for uncomplicated delivery in the intact capsule, we can operate without hesitation on still greater numbers of immature cataracts than formerly, if they cause much disturbance of vision.

That the intracapsular method is technically more difficult can be no reason against learning it. It presumes great experience in operating on cataract in general, and in the mastery of its complications. Obstacles to widespread use of the intracapsular method of extraction are to be found alike in the difficulty of teaching it, because the right amount of traction and pressure in extracting the lens in its capsule is after all a matter of touch; and in the difficulty of learning it, since it is executed with difficulty in the eyes of cadavers and cannot be done in the proper manner in pigs' eyes, so that one is thrown back upon the precious material of diseased human eyes.

In the following summary of the fifty operations performed in the year under consideration, those cases delivered with an intact capsule are designated, according to Elschnig's method of marking, by "+"; those in which the capsule ruptured during passage of the lens through the wound but allowed complete delivery are designated by "+—"; and those in which the capsule tore when seized with the forceps, necessitating extracapsular completion of the operation, are marked "—":

50 eyes, 21 men, 29 women, ages from 40 to 86 years: 4 cases of diabetes, 3 of

high blood pressure (180 to 240 mm.), 3 of high myopia, 1 of cataract complicated with retinitis pigmentosa, and 1 of cataract with heterochromia.

(+) Extraction with capsule intact, 40 cases, or 80 percent.

(+—) Capsule torn during passage through the wound, but entire lens and capsule removed, 6 cases or 12 percent.

(—) Completed extracapsularly, because capsule tore either upon grasping with blunt forceps, or after inability to grasp with blunt forceps had led to use of toothed forceps, 4 cases, or 8 percent.

Kind and stage of the cataracts:

	+	+—	—
12 incipient	11	1	
2 moderately intumescent	2		
24 almost or entirely mature	20	3	1
7 hypermature	3	2	2
3 nuclear	2		1
1 heterochromia	1		
1 retinitis pigmentosa	1		
50	40	6	4

We see from this that complicated cases were also operated upon since no special selection of cases was used except that greatly swollen cataracts were excluded.

The **complications** are summarized in the following:

Loss (endophthalmitis, expulsive hemorrhage, etc.): 0.

Vitreous loss: 0.

Vitreous in anterior chamber: 3 (subsequent distortion of the pupil by folding and sinking in of the iris).

Choroidal detachment: 2. Shallow anterior chamber, filtration of the cicatrix for nearly fourteen days (dehiscence of the scleral wound from oblique suture) mild iritis, then solid cicatrization. V: 6/12.

Iris-prolapse: 0 after basal iridectomy (23 eyes).

Six after incision at root of iris (27 eyes), of which two were replaced after basal iridectomy with preservation of round pupil, three had complete iridectomy, one had iris incarcerated under the conjunctiva (patient refused correcting operation).

Final condition of the pupil:

ideally round	35=70%	82%
almost round	6=12%	
complete coloboma	3= 6%	18%
iris incarcerated	1= 2%	
sinking in of iris	3= 6%	
distortion after iritis	2= 4%	

The vision of the patient upon discharge is essentially better than after extracapsular extraction; this is explained by the absence of lens remains.

Vision at discharge (11th to 27th day) on an average after 14 days: 6/6 to 6/12, 35; 6/18 to 6/24, 10; 6/36 to 6/60, 2; counting fingers, 3. Of these last three cases, one had lens remains, and operation was completed by extracapsular method (final vision 6/18, senile atrophy of papilla, central scotoma); one had retinitis pigmentosa; and one had central choroiditis.

Vision at the final test: 6/5, 2; 6/6, 19; 6/8, 14; 6/9 to 6/12, 11 (of which two had central corneal scar, one retinitis diabetica); 6/18 to 6/24, 2 (of which one had senile atrophy of papilla, one not subsequently examined); counting fingers, 2 (of which one had retinitis pigmentosa and one central choroiditis).

Comparison with the fellow eye

One case was operated upon in both eyes intracapsularly, with 6/6 in each eye. In fourteen cases, the first eye was operated upon extracapsularly by a skillful surgeon, while the second eye was operated upon intracapsularly.

	Intracapsular
6/6	
6/6	
6/6	(iris prolapse replaced)
6/8	
6/6	
6/6	
6/9	
6/6	

6/6
6/6
6/6 (sinking in of iris due to vitreous in anterior chamber)
6/6
6/5
6/9

Extracapsular

6/9
6/24 (in spite of discission, distortion of the pupil, posterior synechia)
6/6 (after discission; myopia without uveitis)
6/24 (secondary cataract)
6/8
6/9 (intracapsular eye better subjectively)
6/6 vitreous loss while expressing lens remains, vitreous in anterior chamber, posterior synechia)
6/6 ("radiations" only before this eye)
6/60 (intracapsular eye subjectively better)
6/6 (intracapsular eye has "clearer sight")
6/6 ("ideal" extracapsular; nevertheless "clearer sight" with intracapsular eye; extracapsular eye "has fallen off")
6/6 (intracapsular eye "is cleaner", extracapsular eye has "rays around lights")
6/6 (subjectively the intracapsular eye is better)
6/9 (objectively and subjectively both eyes alike)

NOTES, CASES, INSTRUMENTS

GUIST'S BONE SPHERES

THOMAS D. ALLEN, M.D., F.A.C.S.
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Because of several requests for information regarding the use and sterilization of Guist's bone spheres, used for implantation in Tenon's capsule following enucleation, it seems that a note in the Journal might be of interest.

These spheres of cancellous bone are prepared from the larger bones of animals. They are thoroughly dried and all soft animal matter is removed. They come in varying sizes designated by their diameter in millimeters, from about 10 to 26; the size most frequently used is 16 mm. As a substitute for Mules's spheres they have certain advantages, the principal one of which is their spongy character; blood vessels and supporting structures can grow along the lamellæ, absorb the foreign matter, and lay down new bone or connective tissue easily. This ingrowth of new connective tissue fastens it in place (Mules's spheres are at times, months or years later, found off to one side of the center of the muscle cone). Also, being fastened in place, it is less likely to be extruded. One precaution of great importance is the complete covering of the sphere with Tenon's capsule (catgut being used), and then this must be covered with conjunctiva.

On Dr. Wilder's service at the Presbyterian hospital, Chicago, it has been the rule to sterilize by heating over the naked flame for two or three minutes; the sphere is held in a small wire basket and turned over and over till it is red hot. It is taken from the wire cage in a heavy Guist introducer. We allow three minutes from the time it is taken from the flame till its introduction. It is pushed at once to the bottom of the muscle cone, care being taken to place it accurately. The air in the hot cancellous bone is rarified; as it cools it contracts and sucks the near-by tissues into its interstices; so that once it touches the tissue it is well nigh impossible to pull it loose, and one cannot push it around in the muscle cone.

If introduced too hot there is a tremendous reaction of necrosis with pain and edema, and rupture of the sutures with a subsequently discharging sinus. It is wise not to heat the sphere too long or more than once, as it is apt to crumble to pieces, and then for months one has to pick out pieces of bone which have not become incorporated in the implant.

We have found a plunger which V. Mueller and Co. added to our Guist introducer very helpful in pushing the sphere to the bottom of the muscle cone.

I recall two cases of trouble. One I am sure was due to the sphere being too hot. Intense edema developed, one or two sutures sloughed out, and there was a discharging sinus for nearly two months. I finally took out the implant. Another sphere I failed to cover completely with Tenon's capsule. The conjunctiva pulled away, leaving the bone exposed over an area 2 by 3 mm. It was kept scrupulously clean, and in about two months it was completely healed over.

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WHISKER IN CORNEA

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Lately it seems to be the fad to report cilia in the anterior chamber, in the punctum, and in other parts of the eye. The following case may be of interest:

T. W., thirty-seven years, male. On account of a mild chronic conjunctivitis he was in the habit of alternately closing and opening the eyelids while bathing the face every morning. This morning, after shaving off a forty-eight hour growth of beard, he followed the usual procedure. He was aware of the accident when it occurred and con-

sulted me a few hours later. He had made the diagnosis as to the kind of foreign body in his eye, but had not located it. A stiff bristle about one millimeter in length had entered the cornea in a tangential plane from above at about the three o'clock position and two millimeters from the limbus, inclined medialward. After butynizing the eye, the bristle was easily extracted by means of sharp pointed forceps. A dressing was applied. Two days later no evidence of the puncture could be made out with the loupe.

INEXPENSIVE LIGHT FOR RETINOSCOPY

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SAN ANGELO, TEXAS

The expense of the usual stereopticon globes used for retinoscopy, and the fact that they did not suit my personal tastes in other ways, led me to experiment in devising a cheaper and more serviceable light for this purpose.

To a tin pan two inches deep and the same diameter as the reflector of my floor lamp, I had three spring clamps bradded. A round hole one-fourth inch in diameter was cut in the center of the bottom. This pan can easily be attached to and detached from the reflector, cutting off all light, except through the small opening. This gives excellent results, except that during prolonged retinoscopies the accumulated heat becomes great.

Recently I have been using another arrangement which I believe is better. A frosted globe of 75 or 100 candle power is selected. A circular piece of adhesive of the desired size is stuck on the globe. The globe is then painted with a thick coat of black, heat-resisting engine paint. It is allowed to dry for about a day before connecting the current. Of course a lot of fumes will be given off when the globe is first heated, but this soon ceases. If the globe is first screwed into the socket of the floor lamp, painting is facilitated, as it then does not have to be touched. After the paint is dried and cooked the adhesive is removed and the underlying glass cleaned with ether. So far this light seems to have solved the problem.

SOCIETY PROCEEDINGS

Edited by Dr. Lawrence T. Post

SAINT LOUIS OPHTHALMIC SOCIETY

October 11 (continued) and November 22, 1929

Dr. William H. Luedde, president

October 11, 1929 (continued)

New operation for entropion

Dr. Meyer Wiener, after reviewing the various methods in common use for the correction of entropion, presented an original modification of the familiar Hotz-Snellen operation. The new procedure consisted of a careful dissection completely exposing the lower margin of the tarsal plate. A strip some three millimeters wide was removed along the entire margin of the tarsus, either with scalpel or scissors. Closure was then effected by five sutures through the skin at the lower wound margin, through the upper edge of the tarsal plate, and through the skin at the upper wound margin.

The advantages of this procedure were: (1) It gave a wider margin between the upturned lashes and the eyeball. (2) No tension was produced on skin and conjunctiva at the lid margin when the wound was closed. (3) By shortening the lid somewhat the palpebral fissure was made wider. (4) Closure of the lid was not embarrassed as the skin of the anterior lid surface was not under tension. This method had been used in numerous cases with results satisfactory after periods up to one year.

Discussion. Dr. Wm. E. Shahan said that the simplest operation for entropion he had ever seen was one devised by the late Dr. John Green. It consisted of a simple incision through the tarsus on its conjunctival surface, parallel to the lid margin and two to three millimeters from it. The skin surface of the lid was then painted with contractile collodion. Any lashes that might be present were laid back upon the skin and attached to it with the collodion. The shrinking of the collodion pulled up the false lid border, drawing the meibomian orifices from the under surface of the lid and around approximately to their normal position. The gaping wound under the lid filled in with new tissue, a new lid margin formed, and there was no shortening of tarsus or loss of skin. He had seen some of Dr. Green's results still perfect after thirty years or more. Daily observation of the collodion was essential to success. If it had broken loose or was not holding the lid margin out in a position of overcorrection, it must be replaced. The remnants were wiped off with a cotton swab soaked in acetone and fresh collodion (always of the contractile variety) applied to the lids and lashes. If the depth or position of the incision had been misjudged, and the result was unsatisfactory, the operation could be wholly or partially repeated without harm. Dr. Green did not advise this operation for the lower lid, but preferred a modification by the late Dr. A. E. Ewing, in which the collodion was replaced by sutures.

Dr. B. Y. Alvis (closing) said that he approved of Dr. Shahan's operation on account of its simplicity and for its effect in lengthening the lid, especially in cases where the lid had been operated on before and had been shortened. On the other hand, in cases with the lid much deformed by scar tissue and hypertrophy of the orbicularis muscle, and in which the patient had a tendency to squeeze the eyes shut and to keep them shut, he considered it necessary to remove a portion of the orbicularis muscle.

The dissection was started at a convenient distance and was continued well around the tarsus, resecting one-half millimeter of the tarsus. This operation gave the patient's eyes a wide open appearance and a much wider border of

mucous membrane at the edge of the lid.

Retinoblastoma with metastasis

DR. E. C. SPITZE reported a case of retinoblastoma of the right eye, in a healthy robust child of six months, whom he had first seen June 18, 1926. The grayish tumor mass, six millimeters in diameter, was located in the temporal portion of the fundus. Since the mother refused to have the eye removed, deep x-ray therapy was tried. From June 29 to July 9, 1926, 250 milliampere minutes, 560 electrostatic "e" were administered by Dr. E. C. Ernst, and again from July 23 to November 26, 1926, 455 milliampere minutes, 1010 electrostatic "e" units were applied. During August, 1926, the tumor was reduced almost to the vanishing point, but in September and October of the same year the tumor again increased in size.

In February, 1927, a small tumor mass appeared in the left eye. The patient was then taken to the Mayo Clinic, where radium applications were made to both eyes. In June, 1928, the right eye was enucleated, and radium applications were later continued.

In May, 1929, a tumor mass appeared on the upper inner aspect of the right forearm and another over the left zygoma. The patient died June 12, 1929, of tumor of the brain. Examination of sections of tumor of the arm showed the typical cells of retinoblastoma.

Discussion. DR. H. D. LAMB said that microscopic examination of the growth from the arm of Dr. Spitze's case showed cells of glioma retinæ. The nuclei were light staining, round or oval in shape, and entirely similar to those frequently found in glioma of the retina.

November 22, 1929

Optic neuritis secondary to postnasal sinus disease

DR. GROVER H. POOS read a paper on this subject which will be published in full in this Journal.

Discussion. DR. M. H. POST said that lesion of the optic nerve from sinus disturbances was a well recognized fact. He praised Dr. Sluder's pioneer investigation of this subject, and said that like most pioneers Dr. Sluder had to bear the onus of much of the overenthusiastic and somewhat reckless extremes to which surgery of this nature had been carried. Following a few brilliant results from surgical intervention, the tendency to operate grew out of bounds, and operation was recommended by the more radical as a diagnostic measure. Not until several tragedies occurred was the gravity of these so-called simple operations appreciated.

The speaker mentioned that Dr. Georges Weill challenged the relation of retrobulbar neuritis with ethmoiditis and sphenoiditis, and that Dr. Cushing flatly denied any association of papilledema with sinus disease, also that Professor Fuchs, in his lecture on optic neuritis at Washington University, had not mentioned any causative association between optic neuritis and inflammation of the sinuses.

The clinical evidence in well controlled cases was far too strong to lead to discarding surgical intervention in cases showing rapid increase of optic neuritis and retrobulbar neuritis, and at times even when no definite evidence of sinus disturbance could be demonstrated, provided the presence of any other foci of infection or contributory neurological disturbances had been eliminated.

DR. J. N. CHARLES said that he considered it our duty to urge or hasten any operative procedure that might be indicated in progressive optic neuritis. He mentioned a case of papilledema in one eye, which he had reported fifteen years ago. The patient had a four plus Wassermann and a hyperplastic sphenoiditis. An immediate nasal operation was advised, but the patient insisted on waiting. In the meantime the syphilis was treated with salvarsan. The vision in the affected eye dropped decidedly; the other eye also showed a papilledema, and the patient went on to complete blindness.

DR. CHARLES believed that the salvarsan had caused a Herxheimer reaction in the syphilitic sinuses, resulting in blindness.

DR. F. O. SCHWARTZ agreed that every possible examination of the patient should be made before the blame was placed on the nasal accessory sinuses. He felt that the rhinologist frequently overlooked a sphenoiditis either because of absence of positive signs or of his lack of clinical training. A number of cases had been seen where mere shrinkage of the nasal mucous membrane had improved vision even though there was no demonstrable intraocular pathology.

He reported a case in which the vision had dropped to 20/192 in one eye. Ophthalmoscopic examination revealed a gray circumscribed ring around the disc margin, which ring was not raised above the level of either the retina or the disc, and appeared as though the fibers of the optic nerve had become more opaque or thickened against a greyish background. On the perimeter chart the outline of the disc was enlarged to include an area of about two disc diameters. There was no scotoma in the peripheral field, except in the temporal quadrant, where there was a dent involving about fifteen degrees. The central scotoma was interpreted as representing an enlargement of the nerve head, the maculopapillary bundle being especially involved.

The usual physical and nasal examinations were reported negative, but two days after shrinkage of the mucous membrane of the nose the vision came up to 20/75, and with —1.50 sphere vision equalled 20/40. After seven days of nasal treatment, vision improved to 20/38 without glasses, and with —1.00 sphere vision equalled 20/30.

DR. W. F. HARDY mentioned three cases of retrobulbar neuritis with scotoma, in which the rhinological examination revealed no nasal pathology. Since the vision was going rapidly, he insisted in all three cases that something should be done. Upon thorough shrinkage of the nasal mucous membrane, vision immediately improved, and it finally reached normal in all three cases.

DR. WILLIAM H. LUEDDE mentioned a case of sudden loss of vision. The vision was 3/200. Dr. Sluder examined the case and found the nose obstructed and the mucous membrane very much swollen. After shrinkage of the membrane and frequent irrigations with warm alkaline solutions, the patient had a discharge of blood and pus from his nose. This was followed by normal vision. About four days later vision again dropped to 20/60, and again relief was had from the same treatment. The speaker said that that choked disc was due to pressure on the venous return. This did not occur at the optic foramen, although it had ofttimes been carelessly stated thus.

DR. POOS (closing) stated that Dr. Dean, in his discussion of Dr. Sluder's paper, had referred to the complication of syphilis in sinus conditions and had cited cases in which a four plus Wassermann was reported with an active sphenoethmoiditis. Yet the operation was done; the sphenoid and ethmoids were opened with immediate improvement—long before any improvement could have been obtained otherwise.

The speaker concurred in the treatment of the nose, by shrinkage of the mucous membrane for the relief of negative pressure, and by opening the sinuses when indicated. He also agreed with Dr. Luedde that choked disc was a venous engorgement due to mechanical pressure, and that Dr. Cushing's theory demanded serious consideration.

Subhyaloid hemorrhage

DR. FREDERICK O. SCHWARTZ read the paper on this subject published on page 195 of this issue.

Discussion. DR. J. N. CHARLES stated that he had seen but one case of subhyaloid hemorrhage during his practice. Upon looking over the literature he found that in 1912 Komoto had shown microscopically that the hemorrhage was really behind the membrana interna. Komoto also found a great deal of fibrin at the bottom of the hemorrhage, and believed that the fluidity of

the blood, spreading so much, was due to some sort of defibrination.

Dr. H. D. Lamb agreed with Salzmann about there being a posterior border layer of the vitreous and an internal limiting membrane of the retina. Subhyaloid hemorrhages from the retinal blood vessels occurred between these two structures. The speaker thought it impossible for single large amounts of blood to collect entirely within the retina, since hemorrhages within the retina were usually small in amount, either thin and spreading in the nerve fiber layer, or globular and in the plexiform layers.

Dr. W. F. Hardy stated that some disbelieved in the presence of a hyaloid membrane and so claimed that the hemorrhage must be beneath the internal limiting membrane of the retina. Since the hyaloid fitted against the retina less firmly in the macular region than in the other parts, there would be at this point a potential cavity in which blood might accumulate.

Dr. Hardy mentioned a case of bilateral subhyaloid hemorrhage due to traumatism, which he had seen at the clinic in 1915. The hemorrhage was symmetrical and showed a classical appearance: the upper portion white and the lower portion red. In one eye there were also several smaller hemorrhages. The patient had 20/240 vision in each eye, but this later cleared up to 20/75, which gave him enough vision to get about. He was then lost from observation.

Dr. Schwartz (closing) said that the treatment of his case had consisted of potassium iodide and rest.

Grover H. Poos,
Editor

COLLEGE OF PHYSICIANS OF PHILADELPHIA

Section on Ophthalmology

October 17, 1929

Dr. C. E. G. Shannon, chairman

Some interesting fundus pictures

Dr. Arthur J. Bedell, Albany, New York (by invitation), exhibited a large number of fundus photographs from his collection of more than 10,000. His demonstration was divided into two parts; in the first single pictures were thrown on the screen, in the second stereoscopic photographs were presented by means of the anaglyph method.

Among the notable single plates were examples of drusen, various types of retinochoroiditis, angioid streaks, partial optic atrophy where the difference in color between the affected and unaffected portions of the nerve was clearly distinguished, asteroid hyalitis, and disclike degeneration of the macula.

The stereoscopic presentation included several cases of tuberculosis, preretinal edema, rupture of the choroid, stages in the progress of thrombosis of the retinal vein, an advancing hypertension, optic neuritis, and choked disc.

By serial photographs the speaker showed the development of angiomatosis, the primary circumpapillary exudate and the dilated vessels. He illustrated massive exudate leading to gross detachment of the retina and iridescent perimacular crystals.

Seventy-five lantern slides made from his original plates were used to illustrate his talk.

The clinic for the treatment of ocular syphilis at Wills Hospital

Drs. Joseph V. Klauder and Harold Robertson (by invitation) read a paper on this subject which will appear in full in the American Journal of Ophthalmology.

Discussion. Dr. Griscom commented on the valuable aid which Dr. Klauder, through his department, had given in the treatment of various forms of ocular syphilis. He emphasized the fact that each case demanded individual study by the syphilologist in order that the most effective forms of treatment might be used. Advances in the therapy of syphilis during the past fifteen years had been such that only one trained in this work was capable of selecting and

applying one or more of the drugs now in use. This was well illustrated in Dr. Klauder's paper, by absence of recurrences and of involvement of the second eye in interstitial keratitis, under selective and intensive treatment. It was important that ophthalmologists should recognize the possibilities of antisyphilitic therapy in this disease, in which involvement of the second eye had by many been considered unavoidable.

Dr. Ernst Fuchs said that we had seen so many interesting cases tonight, showing the consequence of congenital syphilis which the unfortunate victims of this disease had to bear, that there was little that he could add. Years ago he had come across another ocular symptom of hereditary syphilis which might be little known. He had seen only one paper, which he believed was read at a meeting in Belfast, which mentioned this, namely that these patients with hereditary syphilis sometimes had vertically oval corneas. In these cases we had vertical elipses and a higher degree of astigmatism. He did not hold that all cases of this type of astigmatism were syphilitic, but certainly a great majority of them were. What he would like to know was if any such cases had been observed in children in the first year of life.

Dr. Robertson, in closing, said he believed that a clinic of this type had a definite place if only for the treatment of interstitial keratitis, for, as had been said, under this form of treatment, in a study of over 100 cases, recurrence had followed in only six percent, which was greatly less than formerly. It was also interesting to note that fifty-two percent of all persons with congenital syphilis who were brought for medical attention had or had had interstitial keratitis, and only twenty-two percent had normal vision. In children this meant many days absence from school, long periods of photophobia and discomfort, and in many instances mental disorganization for the rest of life.

It was interesting to note that interstitial keratitis left restricted or actually damaged vision, only sixty percent ultimately recovering full vision. This was very unfortunate when modern methods of treatment resulting from a clinic of this type brought such great relief to the interstitial cases.

Drusen

Dr. Warren S. Reese showed a case of drusen of both nerve heads. He called attention to the fact that this affection was perfectly consistent with normal vision when there were no other ocular disorders.

A. G. Fewell,
Secretary.

BALTIMORE OPHTHALMOLOGICAL SOCIETY

November 7, 1929

Dr. Leo J. Goldbach, president

Tuberculous retinitis, tuberculin therapy

Dr. Clyde Clapp read a paper which will be published in full in this Journal.

Discussion. Dr. Leslie N. Gay had been impressed with the results of tuberculin therapy in cases similar to that which was reported. He had carried on the treatment of this particular patient over a period of months and wished to emphasize the importance of ophthalmological examinations made every two weeks while the patient was receiving tuberculin treatment.

To test the sensitivity of patients suspected of having tuberculosis of the eye, he said that the initial dose should be 1/1000 milligram of tuberculin, given intradermally. If the patient failed to react to this injection, he should then be gradually tested until he either failed to react, or reacted to one milligram. A patient who reacted to 1/1000 or to 1/100 milligram might be suspected of having a disease of the eye of tuberculous nature, providing all foci of infection had been eliminated. If the patient reacted to 1/10 or one milligram there was considerable doubt as to the nature of the lesion in the eye being tuberculous.

He said that in regard to treatment it was best to begin with extremely

weak dilutions. The initial dose usually was 1/1,000,000 of a milligram. The treatment was given twice each week until one milligram had been reached, after which time treatment should be continued, an injection being given once each week until 100 milligrams had been given. Altogether the treatment should be continued over a period of at least one year. After the maximum dose of 100 milligrams had been given, then it was advisable to repeat the dose of 100 milligrams at weekly intervals for a period of three months.

The most important features of the treatment of ocular tuberculosis were that treatment should not be given until all foci of infection had been removed, or until the removal of such infection had definitely failed to improve the eye. At least two or three months should elapse after removal of the infection before the treatment was commenced. Treatment should not be undertaken by any one who was not in a position to follow and interpret changes in the eye of the patient who was receiving treatment.

Dr. Lloyd B. Whitham mentioned a case he had seen with some corneal involvement which suggested a tuberculous lesion, and in which he had advised an intradermal tuberculin test. As the patient was leaving Baltimore immediately and examinations could not be made, he was advised to consult a doctor in another city. This doctor made a diagnosis of conjunctivitis eczematosa, advised against the use of tuberculin, and recommended careful regulation of the diet. The condition did not improve, and later, when a tuberculin test was made, it was found to be positive, and under treatment the corneal condition improved very remarkably.

Dr. W. H. Wilmer mentioned a case of glaucoma which required operation, but was very sensitive to tuberculin. The operation was postponed and tuberculin given with a decided improvement in the condition of the patient's eye.

Dr. Clapp, closing, said that he was quite willing to accept Dr. Gay's interpretation that these eye lesions would better be called "arrested cases" than "healed cases," as they frequently showed a tendency to recurrence, but the same might be said of an iritis, as it also showed a tendency to recurrence even if nontuberculous.

In answer to Dr. Carroll's question whether these cases were primary tuberculosis he said that this was not in the least the conception. The only primary cases of tuberculosis of the eye were those very rare ones involving the conjunctiva.

Impressions of the Thirteenth International Congress of Ophthalmology

Dr. W. H. Wilmer (by request) gave a talk on his personal observations of the Congress, with a brief outline of the program.

On the morning of September fifth, the Colonial Institute was opened for registration of the members of the Congress. This usually very trying part of a large congress was made agreeable by the excellence of the arrangements, and by the efficient help of a number of charming young women who spoke many languages fluently.

In the afternoon, the congress was officially opened by the Queen Mother. Dr. Van der Hoeve, president of the Congress, made an address of welcome in six different languages, and greetings were brought from thirteen countries, the representative from Italy speaking in classical Latin.

In the morning of September sixth, there was a general meeting which was given up to demonstrations. In the afternoon there was a symposium upon the etiology and nonoperative treatment of glaucoma. The discussion was opened by Duke-Elder (London) who considered the nature of the production of the aqueous, the gel-like nature of the vitreous, and the equilibria of the various ocular fluids. Hagen (Oslo) spoke of the difference between the action of miotics and the action of adrenalin and ergotamin. Magitot (Paris) said that glaucoma was of the nature of an edema; that in glaucoma it was a

case of a "sick eye in a sick body," and that the treatment should be medical rather than surgical. Wessely (Münich) laid stress upon the great complexity of the etiological factors of glaucoma—somatic, local, endocrine, etc. He cautioned against miotic treatments allowing the proper moment for operation to pass unutilized. This discussion was continued late into the afternoon.

On September seventh, both morning and afternoon, the Congress met in three sections. The subjects varied greatly—anatomy, etiology, refraction, therapeutics, visual standards, etc.

On September ninth, in a general meeting, there was a symposium upon trachoma. In connection with this discussion, there were sent out eight precessional brochures containing in all about 959 pages. This disease was discussed by twenty-two ophthalmologists from different parts of the world, from every standpoint—geographical distribution, scientific investigation, economic control, etc. In the afternoon, all three sections were in separate sessions.

On Tuesday, September tenth, both in the morning and the afternoon, the Congress met in three sections with a miscellaneous program.

On Wednesday, September eleventh, there were no scientific sessions. Members of the Congress departed for Scheveningen in four groups, one section by boat to Leyden, one by boat to Haarlem, one by way of Delft, one by the port of Rotterdam.

On September twelfth, at 8:30 in the morning, there were thirteen papers. Of these latter meetings Dr. Wilmer could not speak personally, as he was not able to go to Scheveningen for the rest of the program. He was informed, however, that Leslie Paton had given a very interesting report of a case of Lindau's disease, and that it was most interestingly discussed by Arvid Lindau himself. A paper upon the treatment of detached retina by Gonin (Lausanne) created some lively comment.

In the afternoon there was a general meeting, with a symposium upon the diagnosis of suprasellar tumors.

Approximately 800 members of the Congress registered, and there were over 200 communications—too many papers to be well assimilated. Some papers were mediocre, some very fine; the average was excellent.

There were two important awards given during the meeting of the Congress; the Leslie Dana medal to Professor Fuchs, for his work in the prevention of blindness; and the Lucien Howe medal to Professor Axenfeld, for his contribution to ophthalmology.

In addition to these scientific sessions, our delightful colleagues of Holland had most wonderful arrangements for social enjoyment. There were numerous excursions, boat trips, motor trips, luncheons, dinners, etc.

On the evening of Monday, September ninth, at 9:30 o'clock, a reception was given at the Palace in Amsterdam, by the Prince Consort. The Palace was a charming medieval building, lighted by nearly 5,000 candles which required practically four hours for the attendants to light preparatory to the reception. The Prince Consort was vigorous, cordial, and a great linguist. There was no monotony in his conversation.

On Tuesday, September tenth, at 8 p.m., the Queen Mother gave a tea at Soestdijk, the summer palace, which was about one and a quarter hours by motor from Amsterdam. As an evidence of their great affection for the Queen Mother, the municipality of Amsterdam had just presented her with a complete installation of electric light through the palace. She was very handsome, very strong, a great linguist, and most charming.

The ophthalmological world was much indebted to our delightful colleagues of Holland. They had been indefatigable in their work, efficient in their accomplishment, with great linguistic ability.

Dr. Van der Hoeve was a model presiding officer and diplomatist.

A. L. MacLean,
Secretary

CHICAGO OPHTHALMOLOGICAL SOCIETY

November 18, 1929

DR. CHARLES G. DARLING, president

(Presentation of clinical cases at Illinois Eye and Ear Infirmary)

Bilateral exophthalmos

DR. MICHAEL GOLDENBURG presented a case of marked bilateral exophthalmos following a thyroidectomy performed about three months previously for a thyrotoxicosis. This case was referred to the Eye and Ear Infirmary from a general hospital, where all efforts to reduce the exophthalmos had failed, including a cervical sympathectomy on one side. A series of photographs was shown of the case at different stages. When first admitted the exophthalmos was very pronounced, the corneas in a state of ulceration, the eyelids displaced to such an extent that they could not be brought together even when the patient was etherized. The eyeballs were not replaceable, and reduction of the exophthalmos failed even with canthotomy and scarification of the bulging conjunctiva. A few days later, under general anesthesia, a horizontal incision was made through what might have been the lower fornix, and the right orbit was thoroughly explored. Tissue was removed for microscopic study, and drainage tubes were inserted. In the left eye only a small incision was made, and a drainage tube was inserted into the orbit. The present state of the eyeball was encouraging and it appeared that the case was out of danger. The patient could now cover both eyes, and the left upper lid had improved to the extent that function was almost normal.

Detachment of the retina

DR. MICHAEL GOLDENBURG said that this case was of interest from the standpoint of history and the sociologic problem involved. The patient, a young woman, had been under observation off and on since 1919. In 1922, with correction, her vision was R.E. 20/30—2; L.E. 20/30—1. She was not seen again until 1928, when she gave a history of failure and ultimate loss of vision in the right eye at about the eighth month of pregnancy. In her second pregnancy, at about the same period, vision in the left eye began to fail, and ultimately she had to be led about. Examination at that time showed many posterior synechias in the right eye, an opaque lens largely involving the anterior layers and capsule; no perception of light. The left eye was dilated to five millimeters under homatropin; no details of the fundus could be seen. Inasmuch as her confinement was expected within two or three weeks, it was suggested that she should return after the birth of her baby, when she was referred to an internist. An extensive physical and laboratory examination disclosed no radical departure from normal.

Later the left fundus cleared up sufficiently for a definite diagnosis of a large bulbous detachment of the retina to be made. Under hospital care, including rigid diet and dehydration, some improvement was noted in the left eye, and she could detect light with the right eye. Having in mind the prognosis in retinal detachment, removal of the cataractous lens of the right eye was suggested, and was accomplished with some difficulty. The patient was discharged from the hospital with only moderate improvement.

About two weeks ago she had returned stating that she had tripped and had injured the right eye. Examination showed the anterior chamber about half filled with fresh blood, but no apparent changes in the left eye. The problem remained as to what the next procedure should be. Drainage through a scleral opening and electrocauterization had not yet been tried; this had not proved satisfactory in other cases. She still had sufficient vision in the left eye to enable her to get about her home, but the vision would probably grow less.

Rupture of the sclera

DR. D. C. ORCUTT presented a case in which the sclera had been ruptured by

a blow. Apparently the eye was lost, but inasmuch as some improvement had been noted it had been decided not to enucleate.

Discussion. Dr. Robert Von der Heydt had seen this case under the slit-lamp. There was a very extensive rupture and much intraocular damage. His opinion was that the man should be returned to usefulness by doing an enucleation.

Dr. Michael Goldenburg had a similar case in the hospital at this time, on which a conjunctival flap operation was done. Unfortunately the case was not seen until about a week after the accident, and, while it was too early to offer a definite prognosis, the eyeball would probably be lost. There was no evidence of tear or rupture of the conjunctiva. A similar case seen some years ago, in which the lens had been luxated through the scleral rupture into the subconjunctival tissues, had recently been observed, and had 20/30 vision. Much could be done if the case were seen early enough.

Retinoblastoma

Dr. D. C. Orcutt presented a three-year-old child who had been seen first last April, with a conspicuous white tumor mass in the left eye. The eye was removed and sectioned, and the laboratory report proved the tumor to be a glioma. Dr. McLaughlin, who performed the operation, used a very small glass globe in Tenon's capsule. At present there was no indication of recurrence of the mass.

Dr. Georgiana Theobald later showed a section from the eye of Dr. Orcutt's patient. The appearance was that of glioma of the retina, with extension into the optic nerve.

Discussion. Dr. Robert Von der Heydt called attention to the optic nerve end shown in the slide. It was infiltrated with tumor extension and was cut off extremely short. When enucleating an eye of this type one should include as much of the nerve as possible. An eighth of an inch more or less might mean a difference of life or death.

Prolapse of iris

Dr. M. H. Lebensohn presented a case of prolapse of the iris five weeks after operation. The patient left the hospital in good condition and returned with the iris prolapsed two or three millimeters, without any history of injury. A conjunctival flap was made covering the prolapse.

Traumatic cataract

Dr. M. H. Lebensohn showed a case of traumatic cataract with the lens in the anterior chamber and secondary glaucoma. An attempt made by an associate to remove the lens was unsuccessful. The eye was very painful and extremely tender. At operation, the lens was removed without much difficulty, and the corneal wound was sutured, as the conjunctiva had been dissected before and was closely adherent.

Complete third nerve paralysis, both eyes

Dr. E. R. Crossley presented a patient who had been under observation and antiluetic treatment for about two years. The ptosis in both lids had been corrected by Hess operations. Recently there had been a slight return of power in the internal recti and a considerable contraction of these two muscles. The external recti were not paralyzed. A wide tenotomy had been done through the conjunctiva, then by means of a stitch through the conjunctival and scleral fibers, on the nasal side of the eye, and through the thick skin on the same side of the nose, traction was made to draw the eye nasalward to a point slightly convergent. This would give the external rectus a chance to become reattached at a point well back of the original point of the insertion of the tendon, so that, in case the tone of the internal recti improved further, the external recti would not oppose too much.

Discussion. Dr. Harry Woodruff said that this was about the only operative procedure which could be used. Nevertheless, one could hardly expect more than a temporary result, and it

would be interesting to see the case a few weeks later. A tendon transplantation was not possible in this case, inasmuch as both superior and inferior recti, as well as the internal recti, were paralyzed. It was possible, however, that the tendons of those muscles, though paralyzed, might exert some holding power.

Posttraumatic macular change

DR. E. R. CROSSLEY said this case showed the condition following a blow from a football about two weeks previously. The macular region was red, with yellowish dots, and partially surrounded by a grayish opaque area, while below there seemed to be a puckering or striation of the retina. A few scattering dark dots were noticeable in the lowest part of the field, possibly unabsorbed small hemorrhages. This macular change might become arrested, leaving reduced vision, or the layers of the retina might become cystic, finally breaking down, producing a macular hole.

Discussion. DR. ROBERT VON DER HEYDT said that the condition in the macula was the result of a blow. There were only three retinal layers in the macula, hence the edema in this case was around the macular region. There were radial retinal folds. It took a long time for a hole to develop: it occurred if the macula went on through cystoid degeneration. Doubt as to the presence of hemorrhages in recent cases of this nature could be removed by examination with red-free light.

Glaucoma: pathologic demonstration

DR. GEORGIANA THEOBALD showed the next three slides of a case of glaucoma which had been under Dr. Findlay's care. There was a marked sclerosis in the retinal and choroidal vessels, and a deep excavation of the optic disc. Although the anterior chamber was deep, the angle was obliterated by the root of the atrophic areas pressing against the cribriform ligament. The first slide showed a slight detachment of the choroid, both to the nasal and to the temporal side of the nerve, due to an albuminous exudate. The second slide showed the iridectomy; the incision was anterior to the canal of Schlemm, and was filled with remnants of iris and fibrous tissue. The exudation of fluid in the suprachoroidal space was most marked back of the site of the iridectomy. In slide three the exudate in the suprachoroidal space had ballooned the choroid 10 mm. into the vitreous. Detachments of this sort were probably frequent following the sudden decrease of tension at operation for relief of hypertension, as the pressure in the eye was much lower than in the vessels.

Discussion. DR. HARRY WOODRUFF said that this was an unusual case in that iridectomy was performed for an acute inflammatory glaucoma without success. The eye was later removed on account of pain and tension. If he read the slide correctly, the corneal incision was a long way anterior to the base of the iris, and consequently a considerable width of iris nearest to the ciliary body was still in the eye. This explained very readily why the eye reached the laboratory, and such an iridectomy could not possibly exert any influence on the glaucoma unless there remained an external fistula. The incision should be far enough back to remove the iris at its root, or the iridectomy was fruitless.

DR. THEOBALD was of opinion that, no matter how perfect the operation, if the iridectomy or trephine opening filled in with connective tissue the increased tension would return.

DR. WOODRUFF agreed that that might be partly true when external drainage alone was the object. But iridectomy, when basal, acted by opening internal drainage, so that a properly performed iridectomy offered two chances of relief, internal, through the canal of Schlemm, and external, through the sclera. This, in his opinion, was a typical laboratory slide of unsuccessful iridectomy.

DR. E. K. FINDLAY said that, when the patient was admitted to the hospital on January twenty-third, the history had been of intense pain in the left eye for

ten days. Eighteen months previously sight had begun to fail, and six months ago the patient was totally blind. The anterior chamber was shallow; tension 70 mm. Diagnosis of glaucoma was made. Under local treatment, sweats, and opiates, the tension fell to 57 mm. and an iridectomy was performed, whereupon the tension dropped to 33 mm. In March the patient returned with intense pain, and the eye was enucleated. This was thought best on account of the patient's physical condition. He was very feeble and suffered intensely, even after the operation.

DR. WOODRUFF said that a cyclodialysis from before backward might have helped to get iris root.

Sarcoma of the choroid with secondary glaucoma

DR. GEORGIANA THEOBALD demonstrated a section from another patient of Dr. Findlay's.

Discussion. DR. E. K. FINDLAY said that this patient, aged forty-two years, had been admitted March 27, 1928, complaining of pain in the right eye. He had been blind for one year. The pupil was irregular, the iris congested and vascular; tension 52 mm.; no perception of light. Atropin was instilled, and paracentesis four days later gave some relief. There was no fundus reflex. The possibility of tumor was taken into consideration, and enucleation was performed on April fourteenth after no response to treatment had been obtained.

Sarcoma of the choroid, secondary glaucoma, surgical aniridia

DR. GEORGIANA THEOBALD showed sections from a case of Dr. Goldenburg's. There was a flat tumor of the choroid lining the sclera on the nasal side, extending 18 mm. from the disc toward the ora serrata, and 7 mm. at its widest part. The retina was atrophic and cystic. It was detached on the nasal side by serous exudate, and on the temporal side by hemorrhage. The lens was very thin and flat. The iris was entirely absent. The ciliary processes were atrophic.

Discussion. DR. MICHAEL GOLDENBURG said that this patient was thirty-seven years of age when he presented himself in 1923 with a history of splashing wood alcohol into the right eye about three years before. A month later the vision began to fail, and within about sixteen months it was practically nil. At the time of examination a mass was found behind the lens, a Y-shaped figure with the stem toward the internal canthus. Tension was 33 mm. Diagnosis was made of iridocyclitis, detached retina, secondary glaucoma, and suspected neoplasm. Transillumination was indefinite. Physical examination was negative, except for chronic ethmoiditis with polyps on the right side. The ethmoids were curetted and an apparent improvement was noted. The patient thought he could distinguish large objects across the room. The mass behind the lens appeared smaller. The pain later became severe, and it was decided to do a broad iridectomy. There was considerable resistance to pulling out the iris, and on tension there was a snap like a rubber band, when the complete iris was found in the forceps. This resulted in marked relief of pain and reduction of ciliary injection. On February 16, 1924, the tension was normal, the eye white and painless, and the patient was discharged with instructions to report frequently. On April 15, 1924, a definite diagnosis of neoplasm was made and the eye was enucleated. Radium treatment was advised and during the several following years while the patient was under observation he was apparently in good health.

Chronic uveitis: diagnosis of glioma

DR. GEORGIANA THEOBALD showed the eye from a second case of Dr. Goldenburg's. On microscopic section the retina was seen detached everywhere by an albuminous exudate which contained few cellular elements. The retina was degenerated and was folded fan-shaped in the anterior half of the bowl. Within its meshes were areas of albuminous and hyalin deposit. The uveal tract

was mildly infiltrated with round cells, chiefly plasma cells. There was a mild diffuse infiltration of round cells at the limbus.

Discussion. Dr. Michael Goldenburg said that when this child, aged 4 years, came to him in December, 1926, the history was very indefinite; no disease or injury. Vision in the right eye was light perception only. Physical examination was negative, and a diagnosis of glioma of the right eye was made. On December 7, 1926, the eye was enucleated; there was no extension or recurrence. Dr. Theobald showed this case more for the purpose of disclosing the error in diagnosis where it seemed quite evident, in contrast to the preceding case where diagnosis was in doubt. It was to be regretted that the hospital records were not more complete in this case.

Probably the most interesting question was why there should be an elevation of intraocular pressure when the neoplasm was located posterior to the lens. This might or might not be present in a large or small tumor. The late Dr. Feingold of New Orleans had a slide of a tumor occupying five-sixths of a globe which at no time had displayed abnormal tension.

Sarcoma of the choroid

Dr. Georgiana Theobald showed a slide from Dr. Crossley's service. The vitreous cavity was almost completely filled with a spindle-cell sarcoma. It contained unpigmented portions, and parts which were so black with pigment that it was impossible to distinguish the cells. There were patches of degeneration and cyst formation.. The tumor extended beyond the bulb along the optic nerve and the posterior ciliary vessels, and anteriorly through the trephine opening.

Discussion. Dr. N. H. Fox said that when this patient came to the Infirmary on December 27, 1926, he complained of severe pain and loss of sight of the right eye; the condition started one month before and was gradually getting worse. He stated that the loss of sight had existed several months previous to onset of pain. Examination showed vision in the right eye to be light perception; tension 52 mm.; conjunctiva injected with marked engorgement of the anterior ciliary veins; cornea steamy; anterior chamber shallow; fundus not visible. Miotics did not have any effect on the condition, and on December 29, 1926, an iridectomy was performed. There was unusual hemorrhage present. The patient was relieved for about a week, and then the symptoms recurred. He left the hospital and did not come under observation again until September, 1928, when he stated that the symptoms for the past month had been so severe that he had had no rest. The right eye was completely blind, and of boardlike rigidity; the anterior chamber was entirely abolished; pupil dilated, irregular and fixed. The pupillary area was occupied by a grayish mass, with marked prominence of the anterior ciliary vessels; there was a palpable tumor mass behind the ball. Paracentesis was attempted for temporary relief but no reduction in tension occurred, and as the incision was made it felt as though the knife entered a solid mass. On September 17, 1928, the right eye was enucleated, and a mass was found attached to the eyeball near the posterior pole, which had penetrated the globe.

Discussion. Dr. Robert Von der Heydt said it was unfortunate that these patients with sarcomata were not studied more at all opportunities offered. The patients did not present themselves early or often enough. In practically every case there must have been a long period when these sarcomata could have been detected through the pupil before tension came on. One of the cases shown progressed to the stage where perforation occurred. Extrabulbar invasion was followed by a long period of remission from pain. Proptosis ensued and the diagnosis was then easy.

Dr. I. Sommer said that the clinical diagnosis of sarcoma of the choroid was not easy in all cases, and often depended

on the pathology of the sarcoma, especially on its relation to the retina. Three different types or stages of tumor development could be distinguished; first, the small tumor over which the detachment of the retina had already taken place, which was quite suspicious of a melanosarcoma if the background of the retina appeared to be dark gray in color; second, if the retina was still attached to the sarcoma and was pushed forward by it, then the outline of the tumor could readily be seen through the ophthalmoscope; third, when the tumor broke through the retina and was no longer covered by it, it might be seen as such with the ophthalmoscope.

Dr. Ramon Castroviejo said it would be unusual for a number of ophthalmologists to agree on every point in the pathology or diagnosis of cases of ocular tumors, such as sarcoma. Not all sarcomata had the quick evolution; some took a long time for development, and it could be proved by the slide (which showed a tumor lying in the posterior pole of the eye), and by study of the anterior pole, that the tumor had a chronic development. This was shown in the atrophy of the stroma of the iris and the ectropium uveæ. If one studied some of the first complications in intraocular tumor and found hypertension with epithelial edema, which could not be seen on a slide because the epithelium was absent, one could note that this edema eventually led to degeneration of the epithelial cells, making a very opaque membrane filled with cysts and filled with liquid, which was difficult to diagnose. In these cases one could not go further than the anterior chamber, with either the slit-lamp or the ophthalmoscope.

Dr. M. L. Folk mentioned a slide from a case which had at one time been presented before the Society as an intraocular tumor, with which diagnosis there had been no disagreement. The eye was later enucleated by Dr. E. V. L. Brown and the mass was found to be a subretinal hemorrhage. The speaker asked Dr. Theobald if there was any particular type of sarcoma which developed necrosis. In the cases presented, where there was extraocular involvement one would expect considerable necrosis, and yet this was not so in these cases.

Dr. Georgiana Theobald said that all sarcomata were rather vascular. Parts of the tumor might undergo necrosis when there was great pressure and the blood supply was cut off. Cytotoxins might develop as a result of necrosis, and might cause further necrosis, including other intraocular tissue.

Robert Von der Heydt

AMERICAN JOURNAL OF OPHTHALMOLOGY

PUBLISHED MONTHLY BY THE OPHTHALMIC PUBLISHING COMPANY

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INTRACAPSULAR EXTRACTION

The methods which have been rather widely employed for extraction of the cataractous lens without opening the capsule may be divided into two groups, according to a fundamental difference in the application of force for rupturing the zonule. The method used by Henry Smith and others upon many thousands of patients in India depends upon pressure from without, through the wall of the eyeball, and when the zonule has once given way in a limited part of its circle the external pressure must be maintained until this rupture of the zonular fibers has extended around the whole circle.

In Smith's method it must be remembered first that the eyeball has been opened widely by an incision involving one-half or more of the corneal circumference; second that, the aqueous having escaped, the ocular tissue which yields most under this external pressure is the jellylike vitreous, which is at first retained within a spheroid cavity whose weakest boundary is the zonular ring; third that, as soon as the zonule has been ruptured, the hydrostatic pressure secondary to the action of the Smith expression hook has a strong tendency to crowd the vitreous out along the line of rupture of the zonule, this tendency being only partially controlled by any special maneuvers employed in following up the tumbled lens; and fourth that if the zonular ring happens to break primarily at the upper side the chance of vitreous escape is greatly enhanced.

These mechanical factors explain the great risk of vitreous escape which is associated with the Smith procedure. They have been largely responsible on the one hand for the reluctance of conservative surgeons to adopt the Smith operation, and on the other hand for the fact that several of the bolder American surgeons who used this method for some time have given it up

in favor of methods, extracapsular or intracapsular, which seem to involve less danger of vitreous escape.

Two other methods of intracapsular extraction may be regarded simply as depending upon traction instead of upon positive pressure. It is obvious that traction for removal of the crystalline lens can only be exerted by some means of grasping the anterior capsule. When a method of traction is employed, although the barrier to escape of vitreous from the eye is partially removed as soon as the zonular ring is ruptured at any point, yet the force tending to displace the vitreous through the breach in that natural barrier is not commonly applied by the surgeon but is only likely to arise from voluntary or involuntary action by the patient.

In the Barraquer suction method, now conspicuously resorted to by some ophthalmic surgeons who were formerly enthusiastic in favor of the Smith operation, traction upon the anterior capsule is made by a vacuum machine, which in Barraquer's own technique is applied with a vibratory intermittence. Unsuccessful use of this apparatus sometimes causes unintentional and serious withdrawal of vitreous. The supporters of the operation maintain that in the hands of a skilled operator the danger of loss of vitreous is not unduly great; while others consider the risk of vitreous loss to be an important defect of this procedure. There may be some doubt as to whether the vibratory feature of the operation as performed by Barraquer does not itself involve added risk of vitreous displacement.

More gradually and sporadically, rather numerous supporters have been found for a method of intracapsular extraction by traction, whose chief advocate in Europe is Elschnig, and in the United States Arnold Knapp. With some variation in different hands this method depends essentially upon rupturing the zonular ring through traction by blunt forceps upon the anterior capsule.

Forceps extraction of the lens in its capsule was strongly advocated in 1911 by Stanculeanu, who seized the anterior capsule and loosened the lens from the zonule by lateral movements, after which he laid the capsule forceps aside and massaged the subluxated lens out of the eye with two spatulas. The operation was therefore a combination of traction and expression, and upon general principles it might be regarded as presenting some of the danger of vitreous loss involved in the Smith operation. Somewhat similar procedures have been employed by Simpson and Sinclair in England, and by Arnold Knapp and Verhoeff, among others, in this country.

Török modified the Stanculeanu technique by maintaining his grasp with forceps upon the anterior capsule and at the same time massaging the dislocated lens out of the anterior chamber by means of a spoon first applied at the lower edge of the cornea. In this country the operation has been frequently referred to as the Knapp-Török.

The principles involved in the forceps method of intracapsular extraction are ably discussed by Safar in the paper of which a summarized translation by Harvey D. Lamb appears in this issue of the American Journal of Ophthalmology (page 219).

Safar characterizes the combined forceps intracapsular operation as much less dangerous than suction or expression alone. The technique which has been followed by Safar at the Meller clinic, in Vienna, is in the main the technique of Stanculeanu and Török, supplemented in Elschnig's hands by a number of procedures intended to add to its safety (akinesia, bridle suture, retrobulbar injection, preliminary wound suture), and somewhat further modified in the Vienna clinic.

As with extracapsular extraction, so in the forceps operation for intracapsular extraction, there is a tendency for each surgeon of much experience to adopt his own group of procedures to which he attaches value as offering the utmost possible security and prospect of success; although some of these accessory procedures may be rejected or more lightly valued by other operators of

equal skill and experience, in whose hands equally good statistics as to visual results and freedom from complication are obtained. The importance of some of these accessory details of operative technique was particularly emphasized by Peter in a recent issue of the American Journal of Ophthalmology (1929, September, page 727). On the other hand there are excellent surgeons who believe that, given sufficient anesthesia, important advantages of simplicity are lost when too many steps are added to the cataract operation.

There are few ophthalmic surgeons who will not admit the advantages of intracapsular over extracapsular extraction, provided the former can be made as safe as the latter. The traumatism involved in the Smith method is so severe that this procedure is not at all likely to find general acceptance. The use of the Barraquer method is likely to be limited to relatively few surgeons commanding large clinical practices. But if it is shown that the technique of removal of the lens in its capsule by means of blunt forceps can be adequately acquired by the majority of ophthalmic surgeons, and that, together with its great advantages over the extracapsular method, this type of intracapsular operation, properly performed in suitable cases, presents at least no greater danger of serious complication than does the classical extracapsular operation, then the operation of intracapsular extraction is very likely to become the cataract operation of choice in a very large proportion of cases.

The conspicuous advantages of the forceps operation are that the visual result is undisturbed by retention of cortex or by secondary opacity due to thickened lens capsule; that no secondary operation is necessary; and that the eye is remarkably free from postoperative iritis. As against the Smith or Barraquer operation, the attempt to extract the lens in its capsule by means of blunt forceps does not preclude completing the operation by the extracapsular method in those cases in which intracapsular extraction fails.

Safar suggests as a disadvantage of the forceps method that it is harder to teach and harder to learn than the extracapsular method, since the exact technique of grasping the anterior capsule and tearing the lens from its suspensory ligament depends chiefly upon the sense of touch. There is the further disadvantage that, in the very occasional cases in which tearing of the capsule does not occur until the lens is halfway out of the anterior chamber, completion of the operation may be extremely difficult.

Although Sinclair (Convention of English-speaking Ophthalmological Societies, London, 1925) apparently seizes the anterior capsule practically at its center, it seems much more logical to carry the blunt forceps as near as possible to the lower edge of the lens, even if the forceps must pass beneath the iris, since in this way traction may be exerted primarily upon a limited section of the zonular ring instead of upon the zonule as a whole or upon a rather considerable arc of its circle. Furthermore, careful consideration of the anatomical arrangement of the fibers of the suspensory ligament in relation to the ciliary body and the lens, and also of the lens in relation to the vitreous and its delicate limiting membrane, will support the belief that peripheral grasping of the anterior capsule should be succeeded, not by rocking of the lens from side to side, but by circumferential traction upon the periphery of the lens first in one direction and then in the other (toward the nasal and temporal sides), parallel to the equator of the lens. As soon as a few fibers of the zonule have been ruptured by this procedure, everything else is relatively easy, for, the lower margin of the lens being freed from its attachments, lifting forward of this lower margin breaks the remaining zonular fibers one after the other.

The difference between this maneuver and the technique advised by Sinclair is not unlike the difference be-

tween tearing out a check from a checkbook by pulling upon one end of the perforated margin, and trying to detach the check by simultaneous and equal traction upon the whole perforated margin at one time.

In the whole field of ophthalmic surgery, no maneuver calls for greater delicacy of touch than this grasping of a delicate anterior capsule with the intent to employ that capsule as a means of traction upon the suspensory ligament. Failure, in properly selected cases, may depend first upon attempting too large a grasp upon the anterior capsule, second upon holding the fold of capsule too firmly, and third upon using traction too brusquely. Every step must be executed slowly and with the utmost gentleness.

Sinclair recommends a four or five millimeter bite of capsule between the blades of the forceps. But a smaller bite than this diminishes the tension upon the capsule by its contents under the pressure of the forceps. The blades of the forceps should be brought together only with sufficient force to obtain a hold, remembering that too firm a grasp will favor a cutting action by the edge of the forceps blade. Lateral (circumferential) traction upon the suspensory ligament must be initiated slowly, so as to minimize again the tendency of the forceps to cut or tear the capsule.

Opinions differ as to whether the grasp of the forceps upon the capsule should be retained until delivery of the lens from the anterior chamber is completed; or whether the forceps should be laid aside as soon as the lens has been partially dislocated. In a very limited experience, it has seemed to the present writer that practically the whole procedure of extraction may be completed by the traction of the forceps, gently held, slowly brought forward into the anterior chamber across the lower margin of the pupil, and carried up behind the posterior surface of the cornea and between the lips of the limbal incision. The necessity for moderate counterpressure, or rather for the kind of stroking movement commonly employed also in the extracapsular operation, perhaps increases with greater firmness of the lens. The more completely it is possible to avoid the use of counterpressure upon the eyeball, the smaller the risk that vitreous will be lost. With a good patient, effective anesthesia, and absence of counterpressure, the danger of vitreous prolapse is relatively insignificant.

W. H. Crisp.

EYE CHANGES OF OCHRONOSIS

The discoloration of the cartilages and fibrocartilages that characterizes ochronosis was observed post mortem and described by Virchow in 1866. A few similar cases were recorded, but it had remained a pathological curiosity until Osler, in 1904, reported two cases in which the pigmentation was recognized in the skin and sclera during life (Lancet, January 2, 1904, page 10). The triangles of exposed sclera near the canthi showed black spots, while intermediate tissue was normal in color, or showed a brownish stain. The cartilages of the external ears also showed bluish-black spots. These discolorations had gradually increased for several years. Hecker and Wolf reported a case showing similar discolorations, and Pope also reported such a case.

An additional case is now reported by K. D. Fairley (Medical Journal of Australia, 1929, November 16), with color plates showing the general appearance and the discoloration of the skin, the sclera, and the cartilages of the ear. The exposed parts of the skin, including the lower lids, showed a pigmentation varying from brown to bluish. There were symmetrical rounded spots in the scleras, to both the nasal and the temporal side of the cornea. "On the nasal side was a purplish-black vertical bar, medially running into a brown patch, extending toward the cornea. Minute vessels passed over the pigmented area. On the temporal side the vessels were more obvious over the area of pigmentation, the color of which was a warm Vandyke brown,

with a blend of yellow ochre medially, and a less definite purplish-black portion laterally." No pigmentation was found on the mucous membranes, except a tiny speck near the angle of the mouth.

The scleral pigmentation is not surprising when we remember that the sclera is fibrous tissue, closely allied to cartilage. Spots of this sort appearing in middle-aged or older persons should suggest possible ochronosis, and should be studied with this in mind. They must be differentiated from beginning pigmented sarcoma, which may present much the same colors, but usually with greater vascularity. They might also be taken for thinning of the sclera, sometimes seen in the ciliary region after gumma. Ochronosis must also be considered in connection with congenitally thin scleras and brittle bones; and other dark spots may be found in the sclera, due to causes not yet understood. The sclera generally has a bluish color in early infancy, due to its thinness and translucency at that stage of development. To understand any one of these causes of discoloration of the sclera will help to throw light on the clinical recognition of all of them.

About fifty-five cases of ochronosis have been reported, and in the majority of these it has been associated with alcaptonuria. Osler's two patients were brothers who both had the latter condition, as had also a nephew who did not show ochronosis. It has been stated that probably all patients with alcaptonuria will show ochronosis at or after middle age. Alcapton is a yellow to brown amorphous substance which darkens if kept standing exposed, so that urine containing it may become black in a day or two. It probably depends on some abnormality of metabolism or excretion.

The case reported by Fairley belongs to a special class of which thirteen cases have been reported. In some of them no alcapton was found in the urine, but a history was given of prolonged use of carbolic acid. Fairley's patient, a woman of sixty-four years, had suffered for twenty-three years with leg ulcer, which for fifteen years had been dressed twice daily with five percent carbolic acid in oil. Three years previously the urine had been discolored and had become black on standing forty-eight hours. On changing treatment the ulcer quickly diminished; the urine in a few days ceased to darken; and in nine months the pigmentation of the skin seemed to have decreased. The study of ochronosis seems to reveal new points of view from which the normal and abnormal pigmentation of the eye may be investigated. *Edward Jackson.*

BOOK NOTICES

History and traditions of Moorfields Eye Hospital. One hundred years of ophthalmic discovery and development. By E. Treacher Collins, consulting surgeon. Octavo, cloth. 283 pages. London, H. K. Lewis and Co., Ltd. 1929. Price 12s. 6d.

The hundreds of ophthalmologists, scattered throughout the world, who have worked and studied at Moorfields Hospital will welcome this record of its workers and their achievements. The thousands who have known it only through those workers and their teachings will welcome the contact the book gives them with this great center of practical ophthalmology. Its author has qualified for the writing of this book by serving in the hospital as clinical assistant, junior and senior house surgeon, curator of the museum and librarian, assistant surgeon and surgeon. In 1922 Mr. Collins retired from his twenty-seven years' service as surgeon; but he has still been an active member of its committee of management. In these later years he has helped ophthalmology broadly, in the organization of the London Convention of English-speaking Ophthalmological Societies, 1925, and of the Thirteenth International Ophthalmological Congress, 1929.

Mr. Collins states in his preface; "Great traditions are the most valuable assets which a hospital or a teaching establishment can possess. They give it a personality which makes it beloved and respected. Traditions are made up of the energies and enterprise of those who have gone before, and will live on from generation to generation, long after the bones of those who have created them have crumbled into dust. The primary aim of this book is to put on record the traditions of the Moorfields Eye Hospital for the benefit of past, present and future workers within its walls. So intimately associated has this hospital been with all the discoveries and developments which have taken place in connection with ophthalmology during the nineteenth century, that it was not possible to write a history of the first hundred years of its existence without giving an account of them also."

In Moorfields the office of surgeon has been held by fifty-three teachers in ophthalmology. At first there was but one, then two, and now twelve. Of these, ten died while in the service. Of these surgeons there are portraits of twenty reproduced in this volume, including those of Mr. Saunders, the founder, his teacher Sir Astley Cooper, Benjamin Travers, and Sir William Lawrence; all great general surgeons, as were most of their successors. Frederic Tyrrell, who succeeded Lawrence, had reverse views of blood-letting, but is remembered for the Tyrrell hook. Dalrymple described the sign that bears his name in exophthalmic goiter. George Critchett, James Dixon, Sir William Bowman, and Sir Jonathan Hutchinson were great masters in ophthalmology. J. W. Hulke, George Lawson, John Couper, Warren Tay, Sir John Tweedy, Edward Nettleship, and Marcus Gunn were worthy successors. None of those still living appear in this gallery of portraits; but among them as many could be named who have equally well carried on the history and upheld the high traditions of the hospital.

John Cunningham Saunders, the founder, was born in Devon and served his apprenticeship there. Although he had been demonstrator of anatomy and assistant to Sir Astley Cooper, he had not been articled at the Royal College of Surgeons, and was therefore not eligible to a higher position in the London hospitals. From 1800 to 1803 troops returning from Egypt had spread infectious ophthalmia in London. Saunders determined to start a special hospital, and, with good professional backing, "The London Dispensary for Curing Diseases of the Eye and Ear" was opened March 25, 1805, at no. 40 Charterhouse Square. The name of the institution was subsequently changed to "London Infirmary for Curing Eye Diseases," and in 1821 to London Ophthalmic Infirmary. This was done at the laying of the "foundation-stone" of the new building in Moorfields. This building was occupied and an introductory lecture delivered there by Mr. Farre, November 12, 1882.

In 1836 the Duchess of Kent consented that she and her daughter Princess Victoria should become patronesses of the institution. The next year, when Princess Victoria had become Queen, and was "graciously pleased to be Patroness of the Hospital," the name was again changed, to "The Royal London Ophthalmic Hospital, Moorfields". This is still the official name for the institution; but to provide for the increase of its work it was removed to a new building on City Road in 1899, two years before Victoria's death. Her royal patronage was succeeded by that of King Edward and Queen Alexandra. The work extended from 600 patients in 1804 to 2,356 in 1808. In 1835 the grand total of patients had arisen to 116,890. Among these, more than 1000 cases of cataract or closed pupil had sight restored. In the early years, patients had been shown and discussed at the anniversary dinners. In 1812 their attendance was dispensed with. In 1811 the practice of the infirmary was opened to medical students, and permission was granted to the medical officers to deliver lec-

tures on the subject of their profession. During the first seven years 412 students received instruction in it. These had come from America, Asia, and continental Europe. How many thousands of ophthalmologists now living have received their knowledge and inspiration from "Moorfields Eye Hospital" it would be hard to estimate.

As students of ophthalmology from Moorfields settled in other parts of the world, special hospitals devoted to the treatment of the eye multiplied. In 1772 Joseph Barth had been appointed lecturer on ophthalmic surgery in Vienna. He was succeeded in 1795 by J. A. Schmidt, and he by Beer, who was made professor of ophthalmic medicine in the university in 1812. Among the first students to avail themselves of the opportunity in London, under Benjamin Travers, were two Americans, Edward Delafield and J. Kearney Rodgers. In 1818 they determined to establish such an institution in New York; and in August, 1820, the "New York Eye and Ear Infirmary" was opened. Dr. Edward Reynolds of Boston, returning from his work with Travers, operated on his own father for cataract; and in 1824 the "Massachusetts Eye and Ear Infirmary" was opened. Travers, being surgeon to the East India Company, in 1819 suggested that institutions should be established in India, similar to the eye infirmary in London. Mr. R. Richardson, who had studied under Travers, was sent to the Madras Eye Infirmary, called since 1888 "The Government Ophthalmic Hospital". In 1824 Mr. Jeafferson was sent to Bombay and Mr. Egerton to Calcutta, where each founded an eye hospital.

The teaching of ophthalmology became more important as time went on; and there has been no ebb in its popularity. In 1851, the first year of the great exhibition in the London Crystal Palace, visitors flocked from all parts of the world; and among them came Albrecht Graefe, of Berlin, and Frans Cornelius Donders, already professor at Utrecht. They came attracted by the fame, as a teacher, of William Bowman; and, while there, were introduced to each other in Guthrie's Eye Hospital by Friedrich Jaeger of Vienna. Thus started a friendship that lasted until Graefe's death, and that stimulated both to great achievements.

In 1851 also came the discovery of the ophthalmoscope by Helmholtz, and Graefe immediately recognized its importance. The wide influence of errors of refraction and accommodation was recognized by Donders a few years later. In his chapter devoted to the discovery of the ophthalmoscope Collins says: "The two decades from 1850 to 1870 may well be described as the golden age of ophthalmology." He describes the earlier method of William Cumming for seeing the fundus reflex of the human eye, and the instrument invented by Charles Babbage for seeing the back of the eye; which "was laid aside as a mere toy" when Wharton Jones failed to recognize its importance.

The forward surge of ophthalmology under the influence of these discoveries, the adoption in London of iridectomy for glaucoma, the development of the squint operation by Critchett, Bowman's probes for lacrimal obstruction, the development of the cataract operation, enucleation to prevent sympathetic ophthalmia, and other advances, illustrate the connection between the history of Moorfields Eye Hospital and the hundred years of ophthalmic discovery and development that followed its foundation.

Many other topics taken up in this book are of high interest and importance. It should be in the library of every English-speaking ophthalmologist; first for the pleasure of reading it, then to refer to and reread, for the inspiration of contact with the great historic events of the growth of his specialty, and most of all for the stimulus it gives to thoughtful consideration of the problems of the present, in the light furnished by the experience of a former generation. This applies to all who are able to think and learn.

As Collins puts it in his preface, "It

has been said that 'when a medical man begins to write on the history of his subject, it is a sure sign of senility'. The writer of these traditions does not claim that his case is any exception to this rule. In earlier life a man has to learn history. In middle life he is engaged in making history; and it is in later years that he becomes best qualified to write history. It is then that on looking back he obtains the most comprehensive view, and is able to regard objects in their truest perspective."

Edward Jackson.

The eye in general medicine: the constitutional factor in the causation of disease, with special reference to the treatment of diseases of the eye. By A. Maitland Ramsay, Glasgow. (Second edition of "Diathesis and ocular diseases".) Cloth, octavo, 247 pages, price $5.00. 1929, William Wood and Company, New York.

In his preface, the author states that this book is written primarily for the junior practitioner and the young ophthalmologist. However, when one considers the attitude, still too prevalent among the profession, that ophthalmology is an isolated specialty and a subject too mysterious for any but the ophthalmologist himself, the book might well be read by every practitioner of medicine in all its specialities today; it contains a wealth of philosophy so fundamentally sound that it is applicable to every branch of medicine and surgery.

While in no way minimizing the value of science in medicine, the plea is for cultivation of the art; the well-tried clinical knowledge handed down to us by our forefathers is a heritage which even in the light of all that is new we cannot afford to forget or leave behind.

The book is not exactly a reference work, but it is replete with detailed information and is well supplied with examples of cases which, although they do not always prove a definite relation of cause and effect, nevertheless do clarify and sustain the argument. The scope of the subject is well indicated by the following list of the chapter headings: (1) the living eye considered as one of nature's laboratories; (2) the constitutional factor in disease, with special reference to some of the ocular manifestations of disordered carbohydrate metabolism. (3) some of the ocular manifestations of defective elimination; (4) the rôle played by the capillaries in the causation of disease, with special reference to the etiology of acute primary glaucoma; (5) the unification of physiological and pathological processes, with special reference to the muscles of the iris and the ciliary body; (6) the medical aspects of eye strain; (7) the offensive power of microbes and the defensive mechanism of the body, with special reference to pneumococcic ulceration of the cornea; (8) the reaction of the body to noxious agents, with special reference to toxic inflammation of the iris; (9) some ocular manifestations of cardiovascular disease; (10) the importance of constitutional in addition to local treatment in many diseases of the eye. There is also an appendix of prescriptions.

Inasmuch as the measurement of ametropia occupies such a large part of the ophthalmologist's practice, the chapter on the medical aspects of eye strain will be read with much interest. The author's attitude toward the status of optometry is well expressed in the following quotation, which will also serve to illustrate the philosophic ideas upon which the book is based. "Some in recent years have tried to promulgate the idea that spectacles concern the optical part of the eye only, and have nothing to do with disease. That is most pernicious doctrine, because in no circumstances can the living eye be treated simply as an optical instrument. It is not only in the body; it is also of the body, and the proper treatment of its optical defects requires the physician's skill just as much as does the treatment of its diseases."

The book is well written, and is delightful, easy reading.

George H. Stine.

Ophthalmological Society of the United Kingdom, Transactions for 1929. Cloth, octavo, 598 pages, 6 plates (four in colors), 98 illustrations in text. Price not given. London, J. and A. Churchill, 1929.

The first report in this volume is devoted to heterophoria; with opening papers by Dr. E. E. Maddox, Mr. Charles Goulden, and Group-Captain Clements, who deals with conditions in aviation. An American, remembering how often he has heard papers and discussions dealing with heterophoria, might think that this was a belated recognition of something that was old in America. But to read these papers and the remarks of the eight prominent British ophthalmologists who joined in the discussion will correct any impression that Americans knew it all before. The British common sense, resources of ingenious experiment, and balanced judgment that are evident in these pages will destroy any undue complacency as to what has been done in America with regard to the "phorias".

The second discussion is on the diagnosis and treatment of ocular tuberculosis. The opening papers were by Sir Arnold Lawson, Mr. R. A. Young, and Mr. S. H. Browning: the discussion was by Whitehead, Duke-Elder, G. Mackay, and M. S. Mayou. Here again the definite statements and practical results do honor to the careful discrimination and practical aims of our British colleagues.

Among important papers are those by Duke-Elder on the structure and properties of the vitreous body; a case of uveoparotid fever with autopsy, by W. C. Souter; formative fibrous tissue reaction in the eye, by E. Treacher Collins; phylogenetic value of the lower part of the retina, by Miss Ida Mann; and a paper on prevention of minor eye injuries in industry, by Mr. Bernard Cridland, followed by general and important discussion.

Again one-half of the volume is occupied by the proceedings of affiliated societies. At the Oxford Congress Professor Meller of Vienna read the opening paper, on the diseases of the lacrimal apparatus. Another symposium, on ocular manifestations of head injuries, was opened by papers of Hugh Cairns, recently with Cushing, and by Charles Goulden of London, followed by broad and abundant discussion. The Doyne Memorial Lecture, by Miss Ida Mann, deals with the vascularization of the vertebrate eye. It is illustrated by two color plates and twenty-eight figures in the text. These illustrations are drawn from various parts of the wide field of comparative anatomy, including illustrations from fishes, reptiles, birds, and some lower mammals. "The blood vessels of the retina and of the iris show a very great diversity among vertebrates."

At the Oxford Congress there were also papers on iritis as a postoperative complication of cataract extraction; Hodgkin's disease with enlargement of the lacrimal glands; the structure of the vitreous, studied by special methods including the slit-lamp microscope; and necrosis of the iris. From the Midland Ophthalmological Society there were, with two short papers, abstract reports of sixty-four clinical cases, shown and reported at its five meetings. The North of England Ophthalmological Society furnished reports of twenty-two such cases, with papers on problems of chronic iridocyclitis, symblepharon, and optic atrophy with pituitary enlargement. The Irish Ophthalmological Society furnished twenty-five cases of unusual interest and importance.

Until its monthly meetings were replaced by the annual congress, the Transactions of the Ophthalmological Society of the United Kingdom were characterized by such reports of cases. Now that its congress is taken up with longer and more formal scientific papers and discussions, the contributions of the affiliated societies give more of the kind of practical ophthalmology that formerly furnished the dominant feature of these volumes. They abound in

novel symptoms, conditions, and therapeutic hints, that make a kind of literature very attractive and stimulating to all who are actively engaged in ophthalmic practice. A reading of these Transactions would be profitable to any ophthalmologist; as a reference book they are valuable to any medical library.

Edward Jackson.

American Ophthalmological Society, Transactions, Vol. 27, 1929. Octavo, cloth, 446 pages, 70 plates, (8 in colors), 113 illustrations. Price not given. Published by the Society, Philadelphia, 1929.

The American Ophthalmological Society has 143 members, 32 associates (who have not yet attended the three meetings required for full membership) and 13 emeritus members; 188 in all. This volume ought to have a much wider circulation than that. With its unusual number of insert plates this is about the largest annual volume the Society has yet issued; and, from the matter it contains, the most important. Probably a limited number of copies will be sold through the secretary, Dr. Emory Hill of Richmond, Virginia. Yet there is much in it of importance to ophthalmology.

After the lists of officers and members, there are biographic sketches with portraits of Lucien Howe, Arthur E. Ewing, Myles Standish, and Joseph A. Andrews, members recently lost through death. Then come the minutes of the sixty-fifth annual meeting, which was attended by sixty-eight members; followed by papers, twenty-three in number, and their discussions. After these are six theses of candidates for membership, which occupy 164 pages, largely devoted to the results of original research; and the stimulation of their production is an important part of the service this Society renders to ophthalmology.

These theses are on the following subjects: tenotomy of the inferior oblique, by J. H. Dunnington of New York; studies on traumatic annular opacity of lens surface (Vossius ring), by J. F. Gipner of Rochester, New York; study of phlyctenular keratoconjunctivitis, by Maud Carvill of Boston; tissue culture in ophthalmic research, by D. B. Kirby of New York; botulism and its ophthalmic lesions, by C. M. Swab of Omaha; anatomy and histology of eye and orbit of rabbit, by F. A. Davis of Madison, Wisconsin. Each thesis is accompanied by an adequate bibliography, and is a contribution that must be considered by future writers on its important subject. Thus bound in one volume they are more accessible and of more practical importance than most such theses that have come into ophthalmic literature from the universities of Europe.

The large number of plates in this volume throw light on a wide range of ocular lesions. The colored plates represent epibulbar carcinoma and neglected epithelioma, peripheral pigmentation of the cornea, nodular scleritis, crystalline deposits in the vitreous, retinitis with massive exudation, lipemia retinalis with diabetes, and coloboma of the optic nerve. The discussions of papers read at the meeting brought out observations that added to the value of the paper. The volume is peculiar in that the only paper referring to cataract extraction was one concerning a new corneal suture, and in that there was no paper on glaucoma.

In the minutes of the proceedings it appears that there remain unsold copies of the Transactions for the last twelve years. There is also a report of the Advisory Committee on Trachoma which should interest all American ophthalmologists. *Edward Jackson.*

Tafeln zur binokularen Untersuchung des Gesichtsfeldzentrums mit dem Stereoskop (Charts for binocular examination of the center of the visual field with the stereoscope). By Dr. Ernst Haitz. Seven stereoscopic charts in cardboard case, with descriptive pamphlet. 4th edition. Price 6.60 marks. München, Verlag von J. F. Bergmann, 1929.

These charts are intended for records of the field within a radius of ten degrees from the center, and particularly for the demonstration of unilateral central scotomata. They are used for binocular examination of the visual field, the second eye remaining open and assuming the task of fixation. The fixation object may be visible only to the second eye or to both eyes, but the test object is only seen by the eye which is under examination. The author recommends the stereoscopic procedure which he described in 1904 in the Klinische Monatsblätter für Augenheilkunde, and these charts are planned for stereoscopic use, although in case of need they can be used for the monocular method. Many patients can maintain fixation much more readily when the binocular method is used. The author acknowledges that there is a certain disadvantage in the fact that his charts apply only to the ten-degree radius; and from this point of view he recognizes that the special construction of Lloyd's stereocampimeter represents an improvement upon his own method. Yet he believes that his charts have the advantage of simplicity in that they can be used with any common form of stereoscope. In some cases the field of study with his charts may be enlarged by having the patient fix the margin of the design on the chart instead of its center. Haitz has found that with good binocular fixation many central scotomata shrink greatly, nearly all scotomata of amblyopia being reduced from an apparent magnitude of thirty degrees to an actual magnitude of not more than ten degrees.

Each chart consists of two unilateral figures which in the stereoscope are blended into a combined image. They are printed in bright grey upon a dark grey background. The objects for campimetric study consist of five needle-thin, dull black holders each of which carries a 2 mm. and a 1⅓ mm. mark made out of Heidelberg colored paper (white, yellow, blue, red, green): the former of these test objects appears in the stereoscope under a visual angle of about one-half degree (40′), the latter under an angle of about one-third degree (27′).

The Haitz charts are inexpensive and are well designed for their purpose.

W. H. Crisp.

OBITUARY

James Whittier May

Dr. R. J. Curdy writes:

Dr. James Whittier May, of Kansas City, Kansas, born in Washington Court House, Ohio, in 1879, died December 19, 1929, of pernicious anemia with degeneration of the spinal cord.

He was past president of the Wyandotte County Medical Society, the Kansas State Medical Society, the Kansas City Society of Ophthalmology and Otolaryngology and the Kansas City Southwest Clinical Society. He was also a member of the Kansas City Academy of Medicine, the American Medical Association, the American Academy of Ophthalmology and Otolaryngology, and the Kansas State Board of Medical Examination and Registration; as well as of the staffs

James Whittier May, 1879-1929.

of Saint Margaret's Hospital and Bethany Methodist Hospital. During the World War he served overseas on the staff of Base Hospital 72, with the rank of captain. He graduated from the college of Physicians and Surgeons of Kansas City in 1900, and spent his professional life in Kansas City, where he had lived from childhood.

Blessed with an exuberant personality and unlimited energy, he participated vigorously in the activities of his town and enjoyed them; not only in medical affairs, but in his church, the chamber of commerce, the American Legion, the Boy Scouts, politics, and music. Anything that involved people was interesting to him.

In an extensive practice his work showed sound judgement and deep human sympathy, and, above all, enthusiasm for his work and results. He was a confirmed enthusiast; the methods of treatment he adopted were the best, his instruments the best, his car the best, and his friends were the best. In his dislikes he was equally wholehearted, but with a wholesome forbearance reminding one of the lovable villains of Frank Stockton's stories, who tried to be wicked but could not. Such a man leaves many friends who grieve at his passing.

ERRATA

In the paper by Dr. Charles M. Swab, December, 1929, the second sentence in column two, page 953, should read, "Other animals not included in these figures were two rabbits, two cats, and one dog used for the purpose of obtaining nerve-muscle preparations of the extraocular muscles and their associated motor nerves." In references (see page 958), the Van Ermengem reference was to the Archives of Pharmacodynamics instead of the Archives of Pharmacology; and the reference to Dickson should show publication date 1918 instead of 1928.

ABSTRACT DEPARTMENT

Abstracts are classified under the divisions listed below, which broadly correspond to those formerly used in the Ophthalmic Year Book. It must be remembered that any given paper may belong to several divisions of ophthalmology, although here it is only mentioned in one. Not all of the headings will necessarily be found in any one issue of the Journal.

CLASSIFICATION

1. General methods of diagnosis
2. Therapeutics and operations
3. Physiologic optics, refraction, and color vision
4. Ocular movements
5. Conjunctiva
6. Cornea and sclera
7. Uveal tract, sympathetic disease, and aqueous humor
8. Glaucoma and ocular tension
9. Crystalline lens
10. Retina and vitreous
11. Optic nerve and toxic amblyopias
12. Visual tracts and centers
13. Eyeball and orbit
14. Eyelids and lacrimal apparatus
15. Tumors
16. Injuries
17. Systemic diseases, including parasites
18. Hygiene, sociology, education and history

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1. GENERAL METHODS OF DIAGNOSIS

Berg, Frederick. **Remarks on the theory of ophthalmometric measurements of curvatures.** Acta Ophth., 1929, v. 7, p. 225.

The article is a presentation of the mathematical principles underlying ophthalmometry, and the measuring of curvatures by photographic methods. It is preliminary to a report; at some future date, of the writer's measurements of corneal curvature by both methods on the same eyes. Mathematically there is no fundamental difference in the two methods: the errors which may creep in are due to faulty observation of the angles and differences in the coordinates, or to faulty direction of the observed eye. Obviously, where several measurements are required, as in ophthalmometry, the errors due to faulty direction of the measured eye are likely to be greater than in a method which permits measurement of the entire surface at one time, as is possible with photography.

Ray K. Daily.

Burns, M. A. **Ocular disturbances in organic nervous disease.** Jour. Med. Soc. New Jersey, 1929, v. 26, Oct., p. 678.

The author insists that the information obtained from thorough eye examinations, including fields, in organic nervous disease is of extreme value, and that the practice of consulting with an ophthalmologist in such cases should be encouraged. He believes that in intracranial lesions the eye findings are much more reliable than x-ray examinations. Several illustrative case reports are given. (Bibliography.)

Ralph W. Danielson.

Del Duca, M. **Radiographic and clinical considerations on the optic canal.** Riv. Oto-Neuro-Oft., 1929, v. 6, July-Aug., pp. 307-339.

The author presents an interesting radiographic study of the optic canal, performed experimentally on skulls, and clinically confirmed by examination of ten patients. For the exact visualization of the optic canal the proper position to give to the head is that proposed originally by Rhese or the same as modified by Balli and MacWilliams. The central rays must fall upon a point situated 7.5 to 8 cm. above the apex of the mastoid of the other side, and 3.5 to 4 cm. behind its anterior margin. The radiographic image of the optic canal is the resultant of the superimposed images of its cranial and orbital orifices, and its oval or circular shape depends upon the relation of the sum of the horizontal and vertical axes of the same orifices. Wrong position of the head,

anomalous passage of the ophthalmic artery, presence of the clinocarotid canal, and high and thick lamina quadrilatera alter the shape of the image of the canal. The clinical cases show, among other conditions, how sellar and suprasellar lesions or sinus lesions may affect the appearance of the canal walls, how traumatic lesions and tumors invading the walls of the canal are demonstrated radiographically by lack of these walls, and how, in cases of periostitis or osteoperiostitis of the apex of the orbit, the margins of the canal appear thick and not clear. (Bibliography and 3 plates, each having 9 figures.) *Melchiore Lombardo.*

Schoenberg, M. J. **Prismoscopic perimetry: a new method of registering paracentral scotomas and other defects of the visual field.** Klin. M. f. Augenh., 1929, v. 83, Oct.-Nov., pp. 533-544. (6 ill.)

One of the most difficult tasks of perimetry is the registering of small paracentral scotomas situated near the fovea. To partly facilitate this Schoenberg has devised a prismoscope which is described and illustrated. It is based on the well known fact that monocular diplopia is produced if a prism is placed before an eye in such a way that its base covers a part of the pupil. If under this condition no monocular diplopia is elicited a scotoma in the direction of the apex of the prism must exist. Other advantages of this method are set forth in detail. *C. Zimmermann.*

Wegner, Wilhelm. **Demonstration polyophthalmoscope.** Klin. M. f. Augenh., 1929, v. 83, Oct.-Nov., pp. 544-548. (3 ill.)

For teaching purposes Wegner has constructed, on the principle of Gullstrand's, an ophthalmoscope which enables nine observers to see the fundus at the same time, magnified twelve times. Such observation is possible only under mydriasis. The apparatus, which is manufactured by Zeiss, is illustrated, with detailed description.
C. Zimmermann.

Wessely, K., and Wertheimer, E. **Color photography of the fundus.** Klin. Woch., 1929, v. 8, Aug. 27, p. 1624.

The authors speak of the development of fundus photography. With the rapid changes in apparatus and with the use of rapid panchromatic plates and proper filters, the possibility of color photographs of the fundi in man is not remote. *Beulah Cushman.*

2. THERAPEUTICS AND OPERATIONS

Caesar, Julius. **Therapeutic and diagnostic value of luetin in ophthalmology.** Oft. Sbornik, 1929, v. 3, pp. 143-164.

Material used for luetin reactions may be obtained in two ways, first, an extract from a pure culture of spirochetes, second, extract from luetic tissue. Luetin has been used not only for diagnosis but also with success therapeutically. Because material for preparing luetin is difficult to obtain, the author used a commercial luetin, Busson's (prepared in Vienna). This gives a positive reaction in tertiary and hereditary lues, when gumma or interstitial keratitis is present. Busson's luetin was used in four cases of interstitial keratitis. The symptoms and treatment of each patient are described in detail. All had a 4+ Wassermann reaction. Two reacted to tuberculin. The cutaneous luetin reactions were negative. Reactions following intradermal injections were either traumatic or nonspecific in the two cases negative to tuberculin. Repeated doses (to 1 c.c.) had no characteristic reactions. In the two cases with the strong tuberculin reaction, the luetin reaction may have been influenced by the tuberculosis. Atropin and syrup of ferric iodide were used. The course of the disease and the ultimate results were not influenced by the luetin. No systemic reaction was noted. *G. D. Theobald.*

Hill, Leonard. **Symposium on the ultraviolet ray.** Trans. Ophth. Soc. United Kingdom, 1928, vol. 48, pp. 252-293.

Hill opens the symposium with a discussion of the more theoretical and general aspects of the biological action of ultraviolet light. Several subsequent speakers discussed the various types of lamp in use, the actual mechanism of treatment, and the results obtained in treating disease of the eye and mouth, and certain systemic disorders. The article is too long and too detailed for abstracting, but is well worth careful reading. *A. B. Bruner.*

Lenard, Emmerich. **Machine for preparing the skin flap for plastic operations.** Klin. M. f. Augenh., 1929, v. 83, Oct.-Nov., pp. 526-530.

The flap, stratum corneum downward, is spread and fastened on a movable plate, so that a razor secured with three screws, and adjustable, can cut off the fat layer evenly and rapidly, thus assuring the desired thinness. The apparatus is made by the factory "Mone," Budapest IX, Ullöer Strasse 1. It is of metal and can be sterilized either dry or in the steam sterilizer, the razor being placed in alcohol. It is described and illustrated. (Cost 260 Pengö.)
C. Zimmermann.

Sabata, A. **The use of polysan in ophthalmology.** Oft. Sbornik, 1929, v. 3, pp. 467-473.

On the basis of Becka's work, the author used "polysan" (magnesium hydroxide) in a wide range of ophthalmic cases. He had excellent results in scrofulous eczema, ulcerative blepharitis, and corneal ulcers. Polysan had very little effect on diseases in the deeper tissues (trachoma, iritis, etc.). It increases leucocytosis and may be used locally, internally, and by subcutaneous, intramuscular, and intravenous injection. *G. D. Theobald.*

Segelken. **Stain therapy with anilin dye in ophthalmology.** Klin. M. f. Augenh., 1929, v. 83, Oct.-Nov., pp. 516-520.

For years Segelken has used with great success a mixture of methyl violet 5, methylen blue 5, alcohol 60, in 100 parts, for eye operations, acute eczema of the lids, and ciliary blepharitis.
C. Zimmermann.

Stastnik, Emanuel. **Solaesthin in ophthalmology.** Oft. Sbornik, 1929, v. 3, pp. 405-409.

Solaesthin (Hocht) is a chemically pure preparation of dichlormethane. On account of favorable reports of its use in general surgery, the author used this anesthetic in fifty-two cases. It may be used for short anesthesia only, as Hellvig states that the stage of excitement lies near the state of tolerance. In twenty-eight cases it was used as preliminary to ether. Elimination of the exciting stage is especially desired, because all operations are performed in bed. Solaesthin is especially useful for short anesthesia. It is administered by dropping slowly on a mask or eight-ply gauze, 150 to 200 drops being sufficient to produce analgesia. The author recommends this anesthetic for the following reasons: (1) It is safe, noninflammable, odorless. (2) Administration is simple. (3) It is chemically pure and economical, and also stable. (4) Analgesia is of longer duration than with ethyl chloride. (5) The patient awakes as from sound sleep, without vomiting or unpleasant feeling. (Bibliography.)
G. D. Theobald.

3. PHYSIOLOGIC OPTICS, REFRACTION, AND COLOR VISION

Heinonen, Oscar. **On the question of changes in the frequency of myopia.** Acta Ophth., 1929, v. 7, p. 301.

According to Levinsohn, Fick, and Cohn, the hygienic measures, such as well ventilated buildings, proper lighting, clearly printed textbooks, and correctly built seats, which have been introduced into the school systems during the last half of the nineteenth century have been ineffectual in reducing the high frequency of myopia among school children. From a study of the students in the high schools of Sweden, Key reported that during the last two decades of the nineteenth century and the first decade of this century the frequency of

myopia had gradually diminished to one-half of its previous percentage; he attributed this change to a more sensible curriculum arrangement, eliminating the necessity for prolonged cramming. In this article the writer makes a detailed analysis, illustrated with charts and tables, of the extent of myopia in the various Swedish schools, and of the changes in the social level of the pupils. He regards myopia as a congenitally predestined anomaly; and he argues that the reduction of myopia in the high schools is due to a democratization of the social level of the pupils. Where formerly only children of the cultured classes aspired to higher education, of late years a great many students come from the industrial and laboring classes. Dinger, Bijlsma, and Steiger, in an examination of the public schools, found a higher percentage of myopia among children of cultured groups than among their companions of the working classes. *Ray K. Daily.*

Loddoni, Giovanni. **The behavior of the color sense in ametropia.** Ann. di Ottal., 1929, v. 57, June-July, p. 539.

It was demonstrated by Helmholtz that if a ray of light was allowed to pass through an opening before which was interposed a cobalt-blue glass, the eye perceived the light spot of different colors according to the amount of accommodation employed. If the accommodation was increased the spot appeared red; if relaxed it was blue, and if intermediate it was of a violet color. The experiments of an English physicist gave added precision to these tests. Rayleigh found that if a large number of people made mixtures with homogeneous red and yellow green (corresponding to the spectral lines of lithium and thallium) in such proportions as would match a homogeneous yellow the red and the green were not always used in the same proportion in those with normal color sense. Some used more green and some more red in the mixture than the others to make the color yellow. This is termed the Rayleigh equation and is the basis of the tests that the author employed in examining sixty-four individuals having various anomalies of refraction. Those using the larger amount of red are termed protanomalous, those who use too much green are called deuteranomalous. The Nagel anomaloscope was the instrument employed. While the number of cases examined was not sufficient to warrant conclusions the results are worth recording. The myopes showed a preponderance of red and the hyperopes a preponderance of green in the Rayleigh equation. *Park Lewis.*

Sanna, Giuseppe. **On the relation and behavior of the ciliary and iris sphincter muscles in the normal and the ametropic human eye.** Ann. di Ottal., 1929, v. 57, June-July, p. 550.

The examination of cadaveric eyes, some of which were emmetropic or moderately hyperopic and others highly myopic, showed a great disparity in the relative size and strength of the ciliary muscles as compared with the sphincters. The conclusions reached were that, while there is normally much variability in the volume and structure of the ciliary fibers, as to total thickness of the muscle, limitation or absence of the circular fibers, or the grouping of the fibers as compared with each other, there is always a singular uniformity in well developed sphincters in both direct and sagittal section. There is no relationship between the development of the ciliary and that of the sphincter, as even in those cases of high myopia in which the ciliary is represented only by thin longitudinal fibers the sphincter is normally developed.

The author attributes this fact to the different embryonic origins, the ciliary coming from the mesodermal tissue differentiating at the fourth month of intrauterine life, while the sphincter traces its origin to the iridoretinal epithelium (anterior fold) close to the pupillary border at about the same period. The sphincter is subject to the changes produced by light, while the ciliary is developed only in relation to the accommodative effort. *Park Lewis.*

4. OCULAR MOVEMENTS

Blatt, N. **The neuropathic constitution as predisposing factor in paresis of ocular muscles following spinal anesthesia.** Wien. med. Woch., 1929, v. 79, Oct. 26, p. 1391.

From analysis of his own and published cases totalling ninety-seven, which shows that paresis of ocular muscles occurs three to twenty-one days after the puncture, lasts from one to sixteen weeks, affects predominantly the abducens, is more common in women, and frequently shows a neuropathic constitution, the author warns against using spinal anesthesia in such individuals. The mechanical explanation of nuclear hemorrhage fails to account for the many days' delay, and the "toxic" theory is also unsatisfactory. In most cases however, stovain, which is the most toxic of the local anesthetics, had been used. *M. Davidson.*

Gifford, S. R. **Muscle transplantation for paralytic strabismus.** Arch. of Ophth., 1929, v. 2, Dec., pp. 651-657.

In three cases the method of Hummelsheim somewhat modified has been used to correct paralytic strabismus with success. Complete tenotomy of the opposing lateral muscle is made first. Then a conjunctival incision is made 3 mm. from the limbus somewhat more than half-way around the cornea, sufficient to expose the superior and inferior recti as well as the paretic lateral muscle. One-third of either rectus on the side nearest the paretic muscle is then separated for one centimeter from its insertion. A doubly armed suture is placed through each slip as near the insertion as possible, the needle passing from below up. Next, these slips of muscle are cut loose at their insertions into the globe, removing a small portion of sclera with them. Both needles are then passed through the paretic muscle from below, the superior rectus thus being anchored under the upper portion of the lateral muscle, and the inferior under the lower portion. The conjunctiva is then brought together and both eyes are bandaged for seven days, at which time a mask may be substituted, with a small hole for vision over the fellow eye, to be worn for three more days. *M. H. Post.*

Stepka, Joseph. **Paralysis of accommodation following ergotin.** Oft. Sbornik, 1929, v. 3, pp. 319-325.

A female, aged twenty-nine years, took pills containing ergotin and extract of hydrastine, of each 0.1 gm., for uterine hemorrhage. After a few hours following the first two pills, languor, drowsiness, vomiting, and foggy vision set in. She continued with the pills for three days, taking only one-half of the prescribed dose. Vision not improving, she came to the clinic. She had a mydriasis of 5 mm., with paretic accommodation. Fundus, fields of vision, and general state were normal. Three days later vision began to improve, with full restoration to normal in three weeks. *G. D. Theobald.*

Strebel, J. **A case of unilateral Graefe's sign in congenital facial myopathy, and its bearing on the mechanism of Graefe's sign.** Schweiz, med. Woch., 1929 v. 59, Sept. 7, p. 906.

A case presenting a right facio-scapulo-humeral myopathy, with involvement of the right abdominal musculature, and other evidence of developmental anomalies in the form of a patent foramen ovale and missing or undescended left testicle, exhibited without the presence of Basedow's disease a striking unilateral true Graefe's sign. This the author believes throws a new light on the genesis of the sign. The true Graefe's is to be distinguished from the pseudo-Graefe's which is seen in the later stages of oculomotor paresis, by the absence of lid retraction in horizontal eye movements. The mechanism of Graefe's sign is discussed and instead of the currently accepted explanation, that of an increased levator tonus due to thyrotoxin, an orbicularis insufficiency with secondary overaction of the levator is suggested as meeting most of the difficulties. Its occurrence in Thomsen's disease, in myas-

thenic paresis, and in paralysis agitans is held to support the hypothesis, though its absence in facial paralysis is admitted to be a valid objection. Stellwag's sign is considered particularly well accounted for by an orbicularis paresis. *M. Davidson.*

5. CONJUNCTIVA

Brückner, Zaboj. **Present views of the etiology of trachoma.** Oft. Sbornik, 1929, v. 3, pp. 1-29.

The author reviews and discusses the literature concerning the etiology of trachoma. More study is needed to determine the significance of Prowazek's inclusion bodies in trachoma and other conjunctival infections. The author's attempts to cultivate trachoma virus according to the methods used by various investigators were negative. In ten cases he endeavored to isolate the bacteria described by Noguchi and Cohen as initial bodies. In eight cases, rich in inclusions, he attempted cultivation according to the method of Majima Kyozo. Finally the author tried to isolate the gram-negative bacilli which Noguchi in 1927 described as the cause of trachoma. In these experiments he used the secretion and conjunctival tissue from twelve untreated trachoma cases. *G. D. Theobald.*

Derer, Josef. **Chronic membranous conjunctivitis a complication of trachoma.** Oft. Sbornik, 1929, v. 3, pp. 439-452.

Membranous conjunctivitis may be due to infection (diphtheria, streptococcus, staphylococcus) or to chemical or mechanical irritation. A few cases are found which resist all treatment and whose etiology is unknown. July 20, 1927, while under treatment for trachoma with pannus formation, by copper sulphate and lactic acid, a female patient aged twenty-two years developed marked membranous patches on the conjunctiva of both lids in each eye. Membranes were thick (to 3 mm.), dirty gray, and when separated from underlying tissue they left a bleeding surface which within twelve hours was again covered with the membrane. Bacteriological examinations were negative. Tuberculosis was suspected, but only round cells and new blood vessels were found in the membrane, with new connective tissue. Treatment had little influence on the membrane, which later covered the ball. X-ray was used three times with temporary improvement. On November 9, 1927, the patient had an acute rise in temperature, with a scarlet rash on the body. The eye condition improved, only to become worse when the fever subsided. On December 7, 1927, mucous membrane from the mouth was grafted on the lids of the left eye, after the membrane was removed. A like membrane formed on the denuded surface in the mouth. December 16, 1927, during an acute attack of laryngitis the eye condition again improved. Leucocyte count was 9,100. On January 14, 1928, the graft on the left eye being satisfactory, the process was repeated on the right. On June 20, 1928, the graft was repeated on the left eye, as the membrane had recurred. Five weeks later the cornea resumed its shiny appearance and the opacities were clearing. The author thinks the membranous conjunctivitis may have been due to the chemical irritation of the lactic acid. (Bibliography, two illustrations.) *G. D. Theobald.*

Gala, A. **The effect of chaulmoogra oil in trachoma.** Oft. Sbornik, v. 3, pp. 121-134.

After instillation of cocaine, the palpebral conjunctiva is energetically massaged with warm chaulmoogra oil by means of a glass rod wound with cotton. Special attention is paid to the retrotarsal fold and the plica semilunaris. After the resulting hyperemia subsides the process is repeated, usually every three or four days. In a series of cases so treated, the author finds improvement in cases where scar tissue formation has not advanced, but only in those places on the lids that were thoroughly massaged. Pannus disappeared when the condition of the

palpebral conjunctiva improved. In another series of cases treated by massage with olive oil, the results were identical with those treated with chaulmoogra oil. Chaulmoogra oil therefore cannot be regarded as a specific for trachoma, as the results obtained are apparently due to the massage. (Bibliography.) *G. D. Theobald.*

Gala, A. **Trachoma antigen and its use in differential diagnosis.** Oft. Sbornik, 1929, v. 3, pp. 411-421.

Although it does not seem possible that a local infection of the eye would affect the whole body, attempts have been made recently to obtain specific blood and skin reactions, especially in trachoma. Conclusions as to immunity, predisposition, and differential diagnosis have been reached. Positive and practical knowledge for differential diagnosis of trachoma have been attributed to Tricoire's intradermal reaction. The author tried the efficiency of trachoma antigen, prepared according to the method of Tricoire and other investigators, in 418 patients with eye infections, 237 of whom had trachoma in various stages, and 181 for controls with other infections. The antigen was prepared from trachoma granules and epithelium gained by abrasion, expression, or extirpation, macerated in physiological salt solution 1 to 10 at 37°C. for forty-eight hours in one series, and fourteen days in another series. One drop of tincture of iodine was added to 10 c.c. of the antigen before it was injected. The iodine was omitted in another series. Other antigen was made by alcoholic extraction. Intracutaneous injections were followed by roseoles and pustules of various sizes within 12 to 48 hours. The intensity and duration of the cutaneous reaction depended chiefly on the quantity of the solution and the sensitiveness of the patient. Children and young adults suffered more intense reactions. Some had a rise in temperature. There was no difference in reaction between patients with trachoma and others with nontrachomatous eyes. Positive reactions were obtained with antigen heated to 60°C. for one hour. Control vaccinations of nontrachomatous patients prove that the reaction is not a specific one and cannot be used for diagnostic purposes. (Bibliography, one table.)

G. D. Theobald.

Kadlicky, R. **The treatment of trachoma.** Oft. Sbornik, 1929, v. 3, pp. 53-73.

On the basis of a review of the literature and his personal study it is the author's opinion that all treatment of trachoma has one objective, and that is to produce with an irritant a reaction which will lead to healing. The best method for producing such a reaction is mechanical abrasion of the conjunctiva. It is a simple procedure and does not needlessly injure healthy tissue. It removes trachoma infiltrations and so shortens the course of the disease. Of operative procedures he prefers a modified Hotz, for the favorable action it has on the disease and for the removal of the entropion. Local treatment must be supplemented by good general physical care and hygienic surroundings.

G. D. Theobald.

Kanda, K. **A case of unusually large serous cysts of the lower conjunctival cul-de-sac of both eyes.** Jour. Med. Assoc. Formosa, 1929, no. 290, May.

The patient, a little girl of six years, was seen because of epiphora and itching of the eyelids of three weeks' duration. No abnormalities were found except the bilateral cysts, each about 15 by 6 mm. Cutting off the anterior walls, scraping, and applying tincture of iodine effected a complete cure.

Ralph W. Danielson.

Kurz, Jaromir. **Xanthosis bulbi.** Oft. Sbornik, 1929, v. 3, pp. 227-265.

On the basis of a review of the literature and his own investigations in four cases, the author draws the conclusion that xanthosis bulbi is a regressive fatty infiltration. It is not dependent

on a general hypercholesterinemia, but on local changes and secondary glaucoma. The author gives an excellent description of the histological details of two eyeballs. (6 illustrations.)

G. D. Theobald.

Lunadei, A. **Considerations on a case of Quincke's edema, and a case of hemiurticaria.** Riv. Oto-Neuro-Oft., 1929, July-Aug., pp. 289-306.

The author discusses different problems connected with the physiopathology of the capillaries, and the pathogenesis of different diseases that go under the general term of angioneurosis. He reports the case of a girl fifteen years old who during her premenstrual period had been suffering with Quincke's edema. She complained of difficult nasal breathing, and showed marked injection of the temporal side of the right and left conjunctivas. She showed also a hard edema of the face, particularly of the eyelids and the nose. The other case was in a woman of fifty-four years, who since girlhood had been affected by crises of hemicrania and crises of typical vasomotor coryza which frequently were associated with urticaria. Lately, after a psychic trauma, she was taken sick with an attack of urticaria, which manifested itself on the right side of the face and the left side of the body. The two cases showed a common nasal symptom consisting of the presence of grey patches surrounded by bluish halos, in the mucous membrane of the septum or of the middle or the inferior turbinals. This symptom, which was described by Wojatschek in bronchial asthma of nasal origin, was found present by the author in other diseases and in seven among fifteen cases of chronic (simple?) glaucoma: in three cases of monocular glaucoma it was unilateral, being located on the same side as the affected eye; in three cases of bilateral glaucoma it was unilateral; and in one case of bilateral glaucoma it was bilateral. No case of acute glaucoma showed the symptom. The author discusses the genesis of the nasal symptom and of the conjunctival injection. He recalls the importance which has been ascribed to the tissues in regulation of the function of the small blood vessels of the skin in these edematous manifestations, and he offers various hypotheses to explain the genesis and the localization of the morbid changes in the cases reported. (Bibliography and 3 figures, 1 is colored.) *Melchiore Lombardo.*

Marinosci, Alessandro. **Experiments on the ophthalmoreaction in affections of the conjunctiva and especially in trachoma.** Ann. di Ottal., 1929, v. 57, June-July, p. 524.

The method adopted by the author was that of Wolff-Eisner and Calmette, to drop at the inner end of the lower conjunctival sac, by means of a dropper, a single drop of one percent solution of precipitated tuberculin. The presence and activity of tuberculosis were determined by the degree of the reaction following. The subjects on which the tests were made were of all ages from five to seventy years. Of sixty-nine trachomatous cases tested with tuberculin only nine responded positively to either the Pirquet or the Mantoux test. The author concludes that the method is not of value for diagnosing tuberculous ocular lesions in trachoma. In trachoma in which there is a chronic inflammatory process of long standing there is a marked histological change in the mucous tissues. The absence of a reaction may be explained by the difficulty if not the impossibility on the part of the altered mucous structures to absorb the tuberculous toxin or rather by loss on the part of the cellular elements of the ability to produce the antibodies which are required to combat the local inflammatory processes. (Bibliography.) *Park Lewis.*

Mikaeljan, R. C., and Transpolsky, I. J. **The significance of constitution in trachoma.** Klin. M.f. Augenh., 1929, v. 83, Oct.-Nov., pp. 461-476. (7 tables.)

As in a former investigation, the authors found that in Kazan trachoma shows no affinity for a certain consti-

tutional type. The anomalous types of constitution occurred equally in trachomatous and in control subjects.

C. Zimmermann.

Ptak, E. **The effect of constitution on the course of trachoma.** Oft. Sbornik, 1929, v. 3, pp. 423-430.

On the basis of a study of the literature and a systematic study of 211 patients in Leser's clinic, the author concludes that senility and constitutional anomalies (scrofula, chiefly) exercise an unfavorable influence on the course of trachoma, which in such cases tends to run a protracted course and to develop corneal complications. (One table. Bibliography.)

G. D. Theobald.

Sabata, J. **Trachoma at the ophthalmological clinic of Masaryk University, Brno, 1927.** Oft. Sbornik, 1929, v. 3, pp. 267-274.

The author discusses the diagnosis and treatment of trachoma in 195 patients. Cultures were negative, and attempts at transplanting to rabbits were negative. He has nothing new to offer in treatment. *G. D. Theobald.*

Slavik, B. **The clinical aspect of trachoma.** Oft. Sbornik, 1929, v. 3, pp. 75-93.

The experimental serum reactions of recent authors are discussed. In Slavik's clinic, fourteen trachoma patients were vaccinated intradermally with secretion from a trachomatous conjunctiva. This secretion was mixed with normal salt solution and filtered. All gave negative results. Eighteen patients were vaccinated with a solution in which trachoma granules had been macerated and filtered. Eight vaccinated with a fresh filtrate were negative. Ten vaccinated with filtrate three to seven days old gave a positive reaction. This may have been due to the albumin content of the solution or to an increase of the virus. Symptoms and differential diagnosis are given at great length. Until the exciting cause of trachoma is found, diagnosis will be difficult. Since writing the paper, thirteen trachoma and three nontrachoma patients were vaccinated with a two weeks old filtrate, all giving positive results. This proves to the author that the reaction is due to the albuminous content of the filtrate. *G. D. Theobald.*

Stastnik, Emanuel. **Treatment of trachoma with copper thiosulphate.** Oft. Sbornik, 1929, v. 3, pp. 195-201.

Local and intravenous injections of copper thiosulphate were made on rabbits to anticipate any untoward reaction on the cornea. Forty-four patients with varying stages of trachoma were treated with copper thiosulphate, locally, intravenously, and combined, with very satisfactory results. Locally it was used in drops or ten percent ointment, with or without massage and expression of granules. The solution for intravenous injection was prepared by dissolving 2 gm. of thiosulphate in freshly distilled water and adding 1 cm. of two percent solution of copper sulphide. This must be a perfectly clear solution without precipitate. Ten injections, four days apart, were given each patient. Temperature and urine must be carefully watched. The results were very striking. In some cases acute symptoms disappeared in five days. Pannus would disappear after the second injection. More experimentation and time are needed to prove the true efficacy of this remedy. (Bibliography.) *G. D. Theobald.*

Svoboda, J. **Acute arthritis following gonorrheal conjunctivitis.** Oft. Sbornik, 1929, v. 3, pp. 459-462.

A thirty-six-year-old prisoner contracted a primary gonorrheal infection of the right eye. This was complicated by a corneal ulcer which went on to perforation. A month after the onset of the conjunctivitis he developed an acute polyarthritis. (Bibliography.)

G. D. Theobald.

Tessir, Giulio. **Note in pseudomembranous conjunctivitis. The clinical**

importance of the pseudomembrane. Ann. di Ottal., 1929, v. 57, June-July. p. 494.

The presence of a pseudomembrane in a conjunctival inflammation is always more or less perplexing as to the true nature of the pathological condition causing it. If the exudate were diphtheric the diagnosis should be made as promptly as possible in order that energetic treatment could be at once initiated, but a misleading diagnosis is equally unjustifiable. It is important to make microscopic and cultural examinations of the conjunctival secretions. The membrane is not always produced by the Klebs-Loeffler bacillus alone. It may be the result of treatment employed, as with silver nitrate or jequirity. Of fifteen cases in which the patients were ill or convalescent, the pseudomembrane occurred in conjunctivitis associated with five scarlatina cases, three of hereditary syphilis, and three of pharyingitis, of which two were of a diptheric character. In two cases ulcerative blepharitis complicated eczema, and in two it developed as a phase of chronic conjunctivitis. This condition developed suddenly in seventeen individuals who up to then had been well. Many other organisms either alone or associated with the Klebs-Loeffler bacillus were found in cases studied by this author, who advocates the use of diphtheric serum in massive doses. *Park Lewis.*

Vujtech, Karel. **Bilateral gonorrheal conjunctivitis with bilateral dacryoadenitis.** Oft. Sbornik, 1929, v. 3, pp. 275-279.

Three months after an acute exacerbation of an old gonorrheal infection, a twenty-five-year-old man developed an acute bilateral suppurative conjunctivitis. Smears showed gonococci. A week later a bilateral inflammation of the lacrimal glands occurred, and another week later a severe metastatic inflammation of the knee.

G. D. Theobald.

Vujtech, Karel. **The treatment of trachoma with Dakin's solution.** Oft. Sbornik, 1929, v. 3, pp. 203-209.

Dakin's solution was instilled three times a day into the left eye of nineteen orphan children who suffered with bilateral folliculosis (trachoma). The right eye was treated with silver nitrate, expression, and massage. After six weeks, the right eye was practically cured in all patients. The left showed little change. The author concludes that Dakin's solution cannot replace the usual therapy. *G. D. Theobald.*

6. CORNEA AND SCLERA

Granström, K. O. **A case of keratitis pustuliformis profunda.** Acta Ophth., 1929, v. 7, p. 330.

The writer reports a bilateral case of this disease, in a woman thirty-nine years of age. The outstanding symptoms were those of keratitis. The left eye, which was the first to become involved, developed iritis and hypopyon secondarily. The local treatment was ineffectual. When the diagnosis of syphilis was established and vigorous antisyphilitic therapy was pushed, the eyes healed rapidly. Fuchs, who first described this disease in 1915, states that usually one eye is involved, that most of the patients are men, and that the primary symptoms are those of intense iritis, the keratitis being secondary to hypopyon. Since syphilis is nearly always the cause of the disease, the writer urges prompt intense antisyphilitic therapy, without waiting for the result of the Wassermann test.

Ray K. Daily.

Ishikawa, F. **The question of relation of marginal corneal ectasia to endocrine disturbance.** Klin. M. f. Augenh., 1929, v. 83, Oct.-Nov., pp. 555-561. (2 ill.)

A peasant, fifty-three years of age, presented typical marginal ectasia of both corneas. Attacks of irritation with marginal infiltration of the ectatic parts rendered it probable that the ectasia had developed on an inflammatory basis. This was corroborated by micro-

scopic changes in excised pieces, perhaps due to chemical alterations of the tissue juices from disturbance of the general condition. There was a marked hypotony of blood pressure, so that Ishikawa made a careful examination of the endocrine functions, which were found disturbed. Hence he is inclined to assume primary degeneration of the entire thickness of the cornea by endocrine disorder as the basis of the marginal ectasia. *C. Zimmermann.*

Kirby, D. B. **Keratitis exfoliativa complicating dermatitis exfoliativa (arsphenamine).** Arch. of Ophth., 1929, v. 2, Dec., pp. 661-669.

The corneal and conjunctival epithelium normally exfoliate, being replaced by cells from the deeper layers, a process similar to that occurring in the skin. In pathological conditions this process may become excessive, resulting in secondary disturbances, such as various ulcerations of the cornea. The administration of arsphenamines in cases of syphilis may produce dermatitis exfoliativa, accompanied by ocular complications. Some of these are true toxic reactions, others are Herxheimer reactions, and still others are neurorecurrences and iridorecurrences. Under the first may be grouped conjunctival hyperemia, transient myopia, and corneal necrosis. Under the Herxheimer reactions may be noted intensification of acute iridocyclitis, occasional activation of quiescent uveitis, sudden blindness in patients with optic neuritis, or tabetic optic atrophy. Neurorecurrences and iridorecurrences follow insufficient primary treatment. Such incomplete treatment results in disappearance of the complement fixation bodies, with later violent recurrences of the original condition unchecked by complement fixation.

The method of treatment employed by Dr. John M. Wheeler for corneal lesions of this nature is recommended. Local anesthesia is used, cocaine two percent and holocain one percent. The conjunctival sac is gently irrigated and the diseased or softened corneal epithelium is removed with a curette and applicators, made by applying a small amount of cotton with collodion to an applicator, after which 3.5 percent tincture of iodine is applied with a similar applicator to the denuded area. Healing occurs rapidly following this treatment.
M. H. Post.

Knapp, Arnold. **Keratoconus: etiology and treatment.** Arch. of Ophth., 1929, v. 2, Dec., pp. 658-660.

Keratoconus is first noticed in adolescence, though it starts some little time before. No pathology has been found, other than some stretching of the corneal tissues. There is no increase in intraocular tension. The subjects are usually anemic, poorly nourished females, frequently with hypothyroidism. Six patients examined by the author showed normal blood chemistry, mild anemia, mild thyroid deficiency, and low blood pressure. A low normal calcium metabolism was present in two cases only. The calcium percentage was normal. Occasionally, it has been reported as a familial disease, which suggests a hereditary element. The author feels that good results have been obtained by cauterization with the galvanocautery until perforation occurred. Iridectomy and tattooing of the cornea have also been employed after the cauterization when necessary. A cautery tip 2 mm. in diameter was used for the major portion of the cauterization, but the final perforation was made with a fine cautery point. Atropin salve and a binocular bandage were used until the anterior chamber had reformed, a matter of from eight to fourteen days, and a firm monocular bandage was worn for the next five or six weeks, day and night, and then five or six weeks more at night only. Herpes of the cornea, superficial punctate keratitis, and intense hemicrania were the principal complications. Slow reformation of the anterior chamber, panophthalmitis, and secondary glaucoma were also observed. *M. H. Post.*

Magnasco, M. **Corneal tattooing with chloride of gold.** Saggi di Oftalmologia, 1928, v. 4, p. 73.

The method of P. Knapp is considered as far superior to the old India ink tattooing of leucomatous corneas. In animals, the color effects obtained ranged from gray chestnut to perfect black, and in human cases the color tones generally resembled the effects obtained in the normal animal cornea. There is relatively no reaction in the Knapp procedure, and the coloration seems more uniform and permanent.

F. M. Crage.

Mazal, Vladimir. **Concerning some methods of treating corneal complications of trachoma.** Oft. Sbornik, 1929, v. 3, pp. 431-437.

At the eye clinic at the University of Brno during 1922-1927, subconjunctival injections of cyanide of mercury were used on eighty patients for the treatment of corneal complications of trachoma (pannus, infiltrations, ulcers). This proved to be a valuable supplement to antitrachomatous treatment, especially in conjunction with powdered dionin. In mild cases, subconjunctival injections of salt had nearly the same effect. Autohemic therapy did not give so good results as reported by Angelucci. (Bibliography.)

G. D. Theobald.

Pillat, Arnold. **The exaggeration of the upper limbus in sickle form in Chinese eyes.** National Med. Jour. of China, 1929, v. 15, Oct., p. 569.

Two cases of this condition are reported and commented upon. Pillat mentions that an inflamed eye of this type gives an impression of pannus. Performing intraocular operations may be made more difficult. (Two figures and references.) *Ralph W. Danielson.*

Roy, Dunbar. **Report of a case of nodular scleritis with observations as to etiology and pathology of this disease.** Trans. Amer. Ophth. Soc., 1929, v. 27, pp. 96-110.

There is no difference between scleritis and episcleritis except in the extent of their involvement, and clinically it is frequently very difficult to differentiate between the two. Nodular scleritis is only the severest form of an inflammatory condition of this tissue.

The etiology is also very obscure. Various causes are advanced by different observers, such as syphilis, tuberculosis, "rheumatism," and the various focal infections. Pathologically, these nodules may contain giant-cells, even if no tuberculosis is present. Sometimes the nodules show neither giant cells nor any other feature suggestive of tubercle. Therefore the assertion that an overwhelming majority of cases of episcleritis and scleritis are due to tuberculosis is questionable. When it occurs in young persons and is extremely chronic in nature, associated with the formation of tubercles in the conjunctiva or in the episcleral tissue, it is almost certainly due to tuberculosis. In these cases tissue can be removed for biopsy or for injection in guinea pigs, after which a positive diagnosis can be made.

In a case of nodular scleritis, the author obtained excellent results by using leeches on the outer and lower portion of the skin of the eyelids. Two leeches were used every other day.

Edward G. Lear.

Sabatzky, Kurt. **A new method of curing serpent ulcer with preservation of corneal transparency.** Klin. M. f. Augenh., 1929, v. 83, Oct.-Nov., pp. 498-501.

The author treated twenty-four cases of pneumococcus ulcer of the cornea with curetting, optochin, and wintergreen oil, four cases being described in detail. All except one healed rapidly, with 5/6 vision. The author thinks that wintergreen oil is a germicide, exerts a specific stimulation for new formation of corneal tissue, and lowers intraocular tension. Probably a chemical combination between the oil and the cell protoplasm takes place, by which

from the start a greater transparency of the new tissue is assured.

C. Zimmermann.

Stastnik, Emanuel. **A contribution to the operative treatment of trachoma pannus by Denig's method.** Oft. Sbornik, 1929, v. 3, pp. 327-330.

The author transplanted buccal mucous membrane over the pannus, according to Denig's method, in five eyes of four patients. In four eyes satisfactory results were obtained. On the third day the fifth eye developed an abscess of the cornea, the result of which was an extensive leucoma, and vision was reduced to fingers at 15 cm. The author recommends the use of copper thiosulphate, as safe and giving brilliant results with corneal scars.

G. D. Theobald.

Vejdovsky, V. **Interstitial keratitis of tuberculous origin.** Oft. Sbornik, 1929, v. 3, p. 403.

On the basis of a review of the literature and his own clinical experience, the author states that tuberculosis of the cornea is rare, and when it does occur is confined to one eye. He discusses tuberculosis of the conjunctiva, sclera and uvea. He finds that tuberculosis manifested itself in the deeper layers of the cornea in the form of multiple small nodules or fewer large nodules, a diffuse smoky infiltration, or a combination of the two. The nodules are gray to yellowish in color and are found at different depths in the cornea. The eye may show only slight injection. Fatty deposits are usually found on the posterior surface of the cornea. The physical examination, a Wassermann test, and a diagnostic test with old tuberculin will aid the diagnosis. Protein therapy is recommended. (Bibliography.) *G. D. Theobald.*

Vujtech, Karel. **Suppurative metastatic scleritis.** Oft. Sbornik, 1929, v. 3, pp. 289-299.

The author reports a case of purulent metastatic episcleritis, secondary to a chronic bronchitis. A yellow nodule appeared in the sclera, 5 mm. distant from the limbus, in the inferior nasal quadrant. Pus and staphylococci were found in its contents. There was also a plastic iridocyclitis with numerous vitreous opacities. After incision, the nodule changed into an ulcer which healed with a flat scar after four weeks. The vitreous opacities cleared up almost completely. *G. D. Theobald.*

Vydovsky. **Cauterization of serpiginous ulcers with chromicized wire.** Oft. Sbornik, 1929, v. 3, pp. 523-528.

The author prefers to use "michrom" (chromicized wire) for the cauterization of corneal ulcers because it is inexpensive and one does not need a complicated apparatus. A michrom wire is heated in a flame and applied to the ulcer, after instillation of cocaine. Healing is more rapid than following cauterization by other methods. Scars are small and so vision is better. (Bibliography.) *G. D. Theobald.*

7. UVEAL TRACT, SYMPATHETIC DISEASE, AND AQUEOUS HUMOR

Brückner, Z. **Congenital drusen of the choroid.** Oft. Sbornik, 1929, v. 3, pp. 135-141.

The author describes in great detail the findings which he thinks are congenital drusen of the membrana elastica of the choroid. A twenty-year-old student presented himself at the clinic, complaining of tearing, which was due to a blepharitis. A routine fundus examination was made. The fundus was dotted with countless yellowish white refractile opaque spots, round or polygonal in shape. In places they were confluent. The size varied from pinpoint to the diameter of the larger vessels. Many were surrounded by various amounts of pigment, giving an appearance as though the fundus were sprinkled with salt and pepper. The retinal vessels were always anterior to the dots. Vision and fields were normal. *G. D. Theobald.*

Croll, L. J. **Aniridia occurring in three generations.** Arch. of Ophth., 1929, v. 2, Dec. pp. 699-701.

In many cases of supposedly complete aniridia, histological examination shows vestiges of iris tissue. This anomaly may be due to the presence of adhesions between the cornea and the lens, or between the edge of the posterior vascular sheath of the lens and the periphery of the cornea, either of which conditions would offer resistance to the development of the iris. The former is the usually accepted theory. Heredity apparently plays a part, as frequent familial cases have been reported. The author adds another, in which there were eleven cases affected and three unaffected in three generations. Further back than the third generation the condition is unknown. Other anomalies, especially those affecting the cornea and lens, are also found in such cases. *M. H. Post.*

Jirman, Jiri. **Concerning the existence of ganglion cells in the iris.** Oft. Sbornik, 1929, v. 3, pp. 211-226.

The author tries to solve definitely the question of existence of ganglion cells in the iris. A 0.9 percent Ehrlich's methylene blue solution is injected into the aorta of an albino rabbit. On microscopical examination the author describes ganglion cells of unipolar, bipolar, and multipolar variety, with connecting fibers which have the appearance of nerve fibers. He distinguished these cells from the fixed cells of the stroma and from cells known as "Schwimmhaütchen". (One illustration. Bibliography.) *G. D. Theobald.*

Jirman, Jiri. **A physiological experiment of automatic movement in the isolated iris.** Oft. Sbornik, 1929, v. 3, pp. 95-117.

The author describes in minute detail the apparatus and method of experimentation. He reaches the following conclusions. (1) A radial section of iris from a cat's eye, suspended in Tyrode's solution at 38°C, has automatic spontaneous movement. The movements have no regularity in amplitude or frequency. A 1 to 50,000 pilocarpin solution causes marked contraction followed by loss of tonus. Atropin in the same dilution causes marked intensity of motion which gradually disappears. (2) If the tension of the isolated iris sector was stretched above normal, the graph recorded the contractions with more regularity as to amplitude and rhythm. The movements were crescentic and decrescentic and occurred 8 to 10 a minute. (12 illustrations. Bibliography.) *G. D. Theobald.*

Kanda, K. **A case of congenital aniridia.** Jour. Med. Assoc. of Formosa, 1929, no. 293, Aug.

Kanda's patient was a Formosan boy of ten years in whom the condition was bilateral. Other associated abnormalities were high hyperopia, microcornea, amblyopia, nystagmus, and congenital cataract. No glaucoma, or coloboma of the choroid or retina, was present. *Ralph W. Danielson.*

Monjukowa, N. K., Fradkin, M. J., and Heyfetz, M. J. **The reticulo-endothelial system and the eye.** Klin. M. f. Augenh., 1929, v. 83, Oct.-Nov., pp. 445-451.

Introductory remarks relate to the importance of the reticulo-endothelial system, a term given in 1913 by Aschoff and Landau to a group of cells in the organism which show a great affinity for acid dyes. This system consists of Kupfer's cells of the liver, the endothelium and reticular cells of the spleen, the bone marrow and lymph nodules, the endothelium of the suprarenal glands, and the so-called histiocytes; and it plays a protecting rôle in some infectious diseases. The physiological function of the reticulo-endothelial system may be tested, as recently proposed, by Adler and Reymann, with (absolutely harmless) Congo red in intravenous injections, by a method here described in detail, and controlled by the Congo red index. The authors employed this in different eye diseases and they report their results in tabular

form. Of especial interest were the analogous findings in tuberculous uveitis and sympathetic ophthalmia, in which they saw some corroboration of the tuberculoid etiology of sympathetic ophthalmia as experimentally propounded by Guillery. The test may be of great value for a criterion of the possible occurrence of sympathetic ophthalmia. Their material, however, is too scanty for drawing any conclusions. *C. Zimmermann.*

Pollakova, J. **A clinical case of metastatic carcinoma of the choroid.** Oft. Sbornik, 1929, v. 3, pp. 377-385.

Defective vision in the left eye brought the fifty-nine-year-old woman to the clinic. Diffuse clouding and balloonlike detachment of the retina were found in the superior temporal quadrant. Perimeter findings revealed an absolute scotoma in the inferior quadrant and a relative central scotoma for all colors. In a short time the same condition appeared in the right eye. The detachment of the retina was progressive and became complete. Transillumination at first was negative, but after several months showed a broad shadow on the left side. A typical cancroid tumor of two months duration was found in the left breast. This was treated with one dose of x-ray. Various remedies were tried to reattach the retina, without avail. After a scleral puncture, a round irregular growth appeared at its site. It was red with a yellowish center. The patient died from cachexia in her home, so specimens were not obtainable. The retinal detachment, with the development of shadows and the cancroid tumor of the breast in a cachectic patient, justifies the diagnosis of metastatic carcinoma of the choroid. *G. D. Theobald.*

Schuberth, K. **Occurrence of anisocoria in apoplectic coma.** Wiener med. Woch., 1929, v. 79, Nov. 2, p. 1428.

On the basis of a series of observations, the author calls attention to the fact that not only does the mydriasis point to the side of the hemorrhage but it is a bad prognostic omen. All cases in which it persisted died within forty-eight hours. *M. Davidson.*

Vannas, Mauno. **Eccentric mydriasis in formulating the indication for optical iridectomy.** Klin. M. f. Augenh., 1929, v. 83, Oct.-Nov., pp. 476-482. (2 ill.)

If the action of the usual stimulants of the sympathetic nerve is localized at a special point of the limbus, either in weak subconjunctival injections or in concentrated instillations, an eccentric mydriasis is obtained which allows measurement of vision with a view to formulating the indication for optical iridectomy. Drops of glaucosan or of ephetonine and cocaine, and subconjunctival injections of suprarenin or adrenalin (1 to 1000), are well adapted for this purpose. *C. Zimmermann.*

8. GLAUCOMA AND OCULAR TENSION

Brückner, Z. **Demonstration of glass membrane in anterior chamber, formed by detachment of Descemet's membrane during cyclodialysis.** Oft. Sbornik, 1929, v. 3, pp. 489-497.

In four glaucomatous eyes operated upon by cyclodialysis, the author found membranous platelets projecting into the anterior chamber and contiguous with Descemet's membrane. The platelets were flat, curved, or folded, and within the anterior chamber terminated in loose ends or firmly connected with the iris or lens. Direct illumination outlined the defects on Descemet's membrane as gray-white lines, while on indirect illumination they resembled glass cracks and showed double contours. The author believes the platelets to be due to the entrance of Daviel's spatula into the anterior chamber. No changes were observed over a period of one to two years. *G. D. Theobald.*

Espildora Luque, C. **The glaucomatous-syphilitic patient.** Arch. de Oft. Hisp.-Amer., 1929, v. 30, Sept., p. 545.

After analyzing again his findings in 300 cases of glaucoma of various types (see American Journal of Ophthalmology, 1930, February, page 177) the author emphasizes the importance of antisyphilitic treatment, especially when no surgical operation can be performed. He describes two cases in Charlin's clinic, one with acute glaucoma in the left eye and hemorrhagic glaucoma in the other, in which antiluetic treatment was sufficient to improve vision and to stop the pain, and the second the case of a girl of nineteen years with congenital syphilis who had an attack of acute glaucoma with severe pain. The general treatment was sufficient to stop the pain and to arrest the progress of the disease. Probably there is a pathogenic relationship between the vascular lesions produced by syphilis and those of glaucoma.

M. Uribe Troncoso.

Franta, Jiri. **Clinical experience regarding glaucoma therapy with preparations of secale cornutum.** Oft. Sbornik, 1929, v. 3, pp. 331-369.

The author studied the effect of secale cornutum (ergot of rye) preparations, "gynergen" (Sandos), "tenosin" (Bayer), and "aminglaucosan" (Hamburger), in fifteen cases of primary glaucoma. He divides these into groups of simple chronic glaucoma, inflammatory glaucoma, and absolute glaucoma. The case reports are given in detail. They show that the preparations in question reduced the tension in some cases, but only slightly and temporarily. Gynergen and tenosin even increased the tension in some cases. These preparations were administered by mouth and subcutaneously. Aminglaucosan instilled locally produced a considerable though only temporary reduction in tension in four cases. The author considers aminglaucosan the most important of the three remedies. His experience leads him to believe that in primary glaucoma the tension is not determined by stimulated or suppressed sympathetics or parasympathetics alone. The theory of Thiel regarding the disturbed harmony of "vegetative" nerves does not satisfactorily explain the pathogenesis of primary glaucoma.

G. D. Theobald.

Gouterman, J. I. **The rôle of calcium in essential glaucoma.** Arch. of Ophth., 1929, v. 2, Dec., pp. 670-678.

Many clinical and experimental observations suggest that the sympathetic nervous system plays a major part in the production of glaucoma and that hyperactivity resulting from irritation and other causes is an important factor. Calcium in excess has a depressing effect on the vasomotor excitability of the cervical sympathetic, as has been shown by experimental, clinical and therapeutic observations. The disturbance of the calcium content of the system can be determined by accurate laboratory methods. In cases of lowered calcium content, the proper balance may be reestablished through the administration of calcium parathyroid, ultraviolet ray therapy or ergosterol.

The author suggests that the data already in hand are sufficient to warrant further observation with regard to control of glaucoma through regulation of the calcium balance. *M. H. Post.*

Guiral y Viondi, R. **Surgical treatment of glaucoma according to its different types.** Arch. de Oft. Hisp.-Amer., 1929, v. 30, Sept., p. 533.

The author has found that for operations in acute glaucoma, according to the technique of Duverger, local anesthesia of the orbit with novocaine four per cent and adrenalin, although giving perfect anesthesia, has bad after effects which consist in permanent dilatation of the pupil, atrophic zones in the iris especially at its borders, indistinctness of the normal relief of the iris, and a toxic action upon the optic nerve which gives rise to incomplete atrophy. He thinks that these after effects are due to paralysis of the motor, sensory and sympathetic branches of the ciliary nerves. *M. Uribe Troncoso.*

Klauber, E. **A contribution to the pathology and treatment of traumatic**

glaucoma. Oft. Sbornik, 1929, v. 3, pp. 484-488.

Thirteen cases of traumatic glaucoma following contusion of the eye (without perforation) were carefully studied by the author. There were eight cases of subluxation, and five cases of luxation, of the lens. Local medical treatment (pilocarpin, eserin, adrenalin, aminglaucosan) was not sufficient to reduce tension. Cyclodialysis was performed in ten cases, seven of which regained normal tension. A second cyclodialysis was performed in two cases and iridectomy in the third. In one case of luxation into the anterior chamber, the tension decreased without operation when the lens was transferred into the vitreous chamber. An operation and salvarsan treatment were necessary for reduction of tension in a luetic patient. Sympathetic inflammation developed in one of the patients after an iridectomy done elsewhere. The author finds cyclodialysis much safer than iridectomy. *G. D. Theobald.*

Knap, F. **A case of congenital hypotony of the eye.** Oft. Sbornik, 1929, v. 3, pp. 371-376.

In a boy aged eleven years the right eye, with +2.00 sph. V. = 6/6, was negative. The left eye with +6.00 sph. +3.00 cyl. axis 20° = fingers at 1.5 meters. The left orbit was as large as the right, but the eye was smaller and on account of a slightly flattened cornea appeared sunken. The tension was 8 mm. Hg. (Schiøtz). The eye was parallel with the right when looking straight ahead. When looking to either side, the action of the recti muscles was retarded and there was a narrowing of the palpebral fissure. The author thinks she was dealing with a hypoplasia of the recti muscles and of the ciliary processes, the secretion of which was relatively insufficient. (Bibliography.) *G. D. Theobald.*

Krasso, Ilona. **The effect of general radiation with Bucky's rays on glaucoma.** Zeit. f. Augenh., 1929, v. 69, Sept., p. 74.

Between the usual roentgen rays and ultraviolet light, rays of a wave length of two angstrom units are recognizable which, according to Bucky, have a definite biologic effect. The author treated eight patients with these rays, and he believes that the intraocular tension can be influenced by general radiation in chronic glaucoma. Even when the tension was not permanently lowered, the time of the pharmacologic action of miotics was prolonged. In one instance miotics were not effective until after irradiation. *F. H. Haessler.*

Vestergaard, J. D. E. **Insulin and ocular tension. Observations on normal individuals, diabetics, and glaucoma patients.** (Preliminary report.) Acta Ophth., 1929, v. 7, p. 271.

The article demonstrates with charts and graphs the effect of intravenous injections of twelve units of insulin on nine normal persons, five diabetics with normal intraocular tension, and four glaucoma patients with seven glaucomatous eyes. He found that in normal individuals the tension fell 3.2 mm., returning to normal in sixty-five minutes. In the diabetic group there was no effect in one case, and in four cases reduction of tension was more marked and of longer duration than in the normal individuals. In the glaucomatous eyes there was a reduction of from twenty-two to thirty-seven percent of the original tension, which occurred in from ten to twenty minutes after the administration of insulin and lasted at least five and one-half hours. The author has not yet determined whether the influence of the insulin on intraocular tension is direct, or indirect through its influence on other internally secreting glands. *Ray K. Daily.*

9. CRYSTALLINE LENS

Basterra, J. **Total extraction of senile cataract with capsule forceps. A new model of capsule forceps.** Arch. de Oft. Hisp.-Amer., 1929, v. 30, Sept., p. 517.

Having practiced total extraction of cataract after the methods of Smith and

Barraquer, the author has found that both are difficult and attended with loss of vitreous. He has arrived at the conclusion that this accident can be avoided with different technique, and has tried capsule forceps for the purpose. The use of this instrument is based on the assumption that the decisive factors in the resistance of the lens to extraction are not the condition of the zonule and its degree of sclerosis, but especially the condition of the capsule. If this is elastic, can be folded by the forceps, and offers resistance to the traction, total delivery can easily be done. The author compares the capsule with the skin of the back of the hand. When the hand is in extension the skin can be easily folded and caught with forceps, but if the hand is in strong flexion it is impossible to catch a fold without lacerating the skin. From this standpoint cataracts should be divided in two groups; first, those with capsule easily folded, as the incipient, the incomplete, and often the soft and partially soft, also some of the hypermature type; second, the group in which the capsule cannot be folded, including hard cataracts, enclosed in a capsule as tight as the cover of a rubber ball, the soft and partially soft cataracts in which the cortical layers are in course of hydration and the capsule is very tense, the cystic, the morgagnian, and finally the hypermature advanced cataract. In seizing this kind of cataract the forceps slide and do not catch; if they do the capsule will be torn.

Basterra believes that the zonule has nothing to do with the resistance of the lens to extraction, because it shares in the sclerotic process of the lens. This can be proved to a certain extent by examination of lenses extracted in toto with capsule forceps. When they are immersed in saline solution and examined with the microscope, it will be seen that the zonular fibers are almost completely absent or are broken off a short distance from the equator.

The author uses a special model of forceps which instead of teeth has two rectangular plates 2 mm. long and 1 mm. wide. The branches of these plates make an angle of 170°, to avoid the risk of pinching the iris with the heel when closed.

Basterra sometimes does simple extraction, sometimes total or partial iridectomy is performed. The capsular forceps are held with the left hand, while the right holds a fine dissection forceps with which pressure is made on the scleral limbus in the lower part of the vertical meridian of the cornea. The forceps is introduced closed into the anterior chamber and pushed down under the iris, even when this is contracted, as the membrane cannot be pinched with the heel of the forceps. The fold of the capsule is taken between the anterior pole and the lower part of the lens. The slight pressure made upon the lens is balanced by slight counterpressure with the dissection forceps outside of the eye. Once the capsule is folded patience must be exercised and all maneuvers gently executed. It is not necessary to make lateral or up and down movements, as some other surgeons advise. It is sufficient to exert mild traction with the forceps upward and outward, which should be helped by corresponding pressure outside of the eye. The lens comes out turning around its axis, the anterior surface becoming posterior as in the suction method. When the lens is detached and passes into the anterior chamber it is convenient in some cases to let it go, and to complete the extraction by slight pressure outside. Otherwise the capsule may be torn out just when the lens passes through the lips of the wound.

The author has done thirty-nine operations, of which 57.7 percent were total, and 40 percent ordinary extractions because of rupture of the capsule during delivery. As complications there were 3.7 percent of loss of vitreous and 3.7 percent of iris incarceration. Seventy-six percent of the operations were performed for incomplete cataract. The author thinks that loss of vitreous is not more frequent than with the or-

dinary methods, when sufficient skill and proper technique are employed.

M. Uribe Troncoso.

Chou, C. H. **The frequency and localization of lens opacities in Chinese observed by slit-lamp examination.** National Med. Jour. of China, 1929, v. 15, Oct., p. 573.

Chou examined 312 eyes and reports 105 with coronary cataract, 28 with anterior axial embryonic cataract (Vogt), four with cataracta centralis pulverulenta, two with punctate cataract in front of the juvenile nuclear surface, and one with atypical posterior cortical cataract. *Ralph W. Danielson.*

Fischer, Franz. **A lentoid in a human microphthalmos.** Zeit. f. Augenh., 1929, v. 69, Sept., p. 30.

In tailed amphibians the cells of the pars iridica and pars ciliaris retinæ, as well as the cells of the retina, can be stimulated to differentiate into lens fibers. Because of the spatial relations no cup can form and hence no real lens can develop. These structures were therefore called lentoids by the embryologists. Ophthalmologists have used the word to designate malformations of the lens in congenitally malformed eyes.

Fischer described a human microphthalmos in which he found a lentoid in the sense of the embryologists, namely a lenslike structure which presumably arose from the epithelium of the ciliary body, showing that the epithelial cells of the human ciliary body are potentially capable of differentiating into lens fibers, and that under abnormal conditions this latent power becomes manifest.

F. H. Haessler.

Goldmann, Hans. **Experimental supranuclear cataract and sclerosis of the nucleus of the lens.** Klin. M. f. Augenh., 1929, v. 83, Oct.-Nov., pp. 433-438. (6 ill.)

After feeding rats daily, for twelve days, naphthalin twenty percent in olive oil, Goldmann observed an opacity of the lens, at first delicate, between the capsule and the nucleus, which reached its maximum size in from two to three weeks. Total cataract never developed, although the opacity did not disappear during a year of observation.

The opacity was nearer to the center in the younger than in the adult rats. The nucleus gave the appearance of brownish cataract and was hard as stone, but this could not have been due to invasion by coloring matter, as the normal lens of rats also develops a brown nucleus in the preserving fluid. The cataract was not complicated, as the uvea was unaltered. Goldman concludes with the assertion that there occur deep toxic changes of the lens without disturbance of the surface.

C. Zimmermann.

Pellathy, A. **Pathological anatomy of experimental tetany cataract in dogs.** Klin. M. f. Augenh., 1929, v. 83, Oct.-Nov., pp. 438-445. (6 ill. 4 col. pl.)

Pellathy describes the condition of the right eye of a dog on whom parathyroidectomy had been performed two and a half years previously. The dog was killed with chloroform and the eyes fixed in formalin, alcohol, and celloidin. The opacities of the lens were always subcapsular and occurred in close connection with tetanic attacks. They were crowded into deeper parts of the lens by the development of new lens fibers. With the slit-lamp could be observed six such opaque zones which for the most part could be histologically proved by the different staining of the strata. The capsular epithelium showed phenomena of degeneration; changed shape and partial necrosis of the cells, and of their nuclei. Between the lens fibers were cavities filled with drops of myelin and albumen or other homogeneous substance. In the superficial cortical layers these formations were fine, in the deeper layers they became coarser and confluent, and in the larger cavities detritus was found. The nucleus of the lens did not show such changes, nor the ciliary epithelium.

C. Zimmermann.

Pflügk, A. **Detachment of the zonular lamella in glassworkers' cataract.** Klin. M. f. Augenh., 1929, v. 83, Oct.-Nov., pp. 549-550.

In a glassworker aged sixty-nine years who had worked for fifty-five years before the open furnace, were found progressive cataractous opacities and detachment of the zonular lamella in both eyes. There was also in the pupillary area of the anterior capsule of each eye a circular opaque zone with sharp indented borders, visible only with the slit-lamp. The author attributes the condition to the action of radiating heat. *C. Zimmermann.*

Politzer, G. **The effect of x-rays on the embryonic lens.** Wien. med. Woch., 1929, v. 79, April 20, p. 551.

Reports of experimental work and clinical observations as to the effects of x-rays on the lens are not entirely in accord, but it is clear that the adult lens reacts differently from that of the embryo and the newborn, and that the response of the latter varies in different animals. In the light of experimental work and histological studies on larvæ of salamandra maculosa exposed to 20 H/1 Al and 9 by 4 H/1 Al, and which only began to show lens changes in the third month after exposure, the theory of increased capsular permeability is rejected, since this is an early effect. Studies of the mitotic phenomena in these lenses led rather to an assumption of "heredocellular" (Schinz) injury to the cells of the capsular epithelium, manifesting itself in atypical mitosis and their final necrosis and exposure of the lens fibers to aqueous. While these observations throw light on the mechanism of the effects of x-rays, yet so far as the human adult lens is concerned the therapeutic doses employed are far below those experimentally capable of producing injury, as shown by the studies of Rados and Schinz.

M. Davidson.

Poyales, F. **Fisher's simplified phacoerisis.** Orch. de Oft. Hisp.-Amer., 1929, v. 30, Sept., p. 555.

The author describes the modification which Fisher of Chicago has made in Barraquer's original method of phacoerisis. This modification, avoiding pressure upon the eyeball, prevents loss of vitreous, iris prolapse, and inflammatory reactions, and produces better final vision. Fisher inverts the whole corneal flap outward after the incision, folding it upon the horizontal diameter of the cornea as a hinge. In this way the placing of the suction cup is easier and more accurate.

M. Uribe Troncoso.

Rucker, C. W. **Regeneration of the cornea.** Arch. of Ophth., 1929, v. 2, Dec., pp. 692-698.

An attempt has been made to remove scar tissue from the cornea, permitting its replacement by transparent corneal tissue, following the work of Boehmig, Hippel, Salzer, Weiner, and Wolfrum. Fifty rabbits in all were employed in the experimentation.

In the first experiment, a section of the cornea was excised after a circular incision had been made through one-half to three-fourths the thickness of it. In about one week, the wound had been covered by the invading epithelium, but within a few days this broke down and tiny ulcers appeared, which healed rapidly. This recurred at intervals. Final healing usually did not take place for several weeks. The underlying tissues were uneven in thickness and the ingrowing epithelium remained very thin and delicate over its prominences. Breakdowns and ulcerations resulted.

In a second group of cases, the lid margins were sewed together, but the number of cases in which infection occurred was not lessened.

In a third series, the conjunctiva was incised at the margin of the cornea and brought forward over the lesion, where it rapidly became adherent to the lesion, preventing the ingrowth of epithelium by dense adhesions.

Corneal regeneration took place in some cases, but the rate of regeneration cannot be determined from this study.

M. H. Post.

Vasek, Emil. **Subconjunctival extraction of senile cataract.** Oft. Sbornik 1929, v. 3, pp. 499-508.

Of 603 cataract extractions in seven years, four developed panophthalmitis, and twelve lost vision on account of hemorrhage, strain, and so on. To lessen the postoperative loss of eyes, the author tried, in a small series of cases, subconjunctival extraction of the lens as described by Pavia and Dusseldorf. The small series of cases does not allow the author to prefer this operation to his own methods, on account of the masking of the field by blood, and gray exudate which forms from the cut conjunctiva. *G. D. Theobald.*

Walker, C. B. **Exactly appositional sutures in the cataract operation.** Trans. Amer. Ophth. Soc., 1929, v. 27, pp. 51-63.

A scleral pocket flap is made after the conjunctival flap (3 mm. wide) has been dissected forward over the extent of the wound. A lip of the sclera, of definite thickness, is obtained with a guarded cataract knife by first making a horizontal cut parallel to the limbus 2 mm. back and one-third through the sclera. Into this cut the tip of the keratome is inserted, splitting the scleral tissue horizontally toward the limbus until the tip of the instrument is barely seen through the cornea. To open the angles of this pocket, radial incisions are made toward the cornea, with either scissors, keratome, or the cataract knife. The sutures are placed before the angles of the flaps are opened.

The finest curved Carrel vascular surgery needles are used, and 00 surgical silk oiled on a pledget with sterile ointment. One good scleral suture fortified by a conjunctival suture on each side may be quite sufficient in all cases except where vitreous loss is feared. The sutures are removed after the seventh day and not later than the twelfth day. They are of great value particularly in intracapsular extraction.

Edward G. Lear.

Wright, R. E. **Akinesia during extraction of cataract.** Arch. of Ophth., 1929, v. 2, Dec., p. 691

O'Brien's technique of blocking the seventh nerve is reviewed and recommended. It has become the routine procedure in the author's clinic in all serious intraocular operations.

M. H. Post.

10. RETINA AND VITREOUS

Behr, Carl. **On the anatomy and pathogenesis of disciform degeneration at the posterior pole of the eyeball.** Zeit. f. Augenh., 1929, v. 69, Sept., p. 1.

This clinical picture, monographically treated by Junius and Kuhnt, is one of the commoner senile diseases of the retina That our knowledge of it is fragmentary is due to the fact that only few eyes have been available for microscopic study. Most of those studied have been enucleated because of the mistaken diagnosis of neoplasm. Probably it is the anatomical end result of diverse processes, each of which results in disturbance of nutrition of the tissue. Behr studied sections from an eye enucleated for supposed neoplasm.

The lesion begins with a transudate which arises in the choroid, passes through the membrana elastica, and separates from it the pigment epithelium, which becomes pushed forward toward the retina. This leads to proliferation of the pigment epithelium, with coincident formation of a cuticular membrane which seals off the retina proper from further transudation, and also to the formation of connective-tissue-like strands which have the same effect.

The fundamental cause of all the changes must be sought in the choroid and, probably, in the choriocapillaris. Here no changes are found except that there are strikingly few blood corpuscles in these arterioles, while the vessels of the damaged area are made visible because their lumen is well filled with blood. Characteristic changes are found in the elastic membrane. There are defects, swellings, and peculiar structures like outpourings of smoke from its sur-

face. One must conclude that not only an anatomical but a chemical modification of the lamina elastica and the contiguous interstitial tissue of the choriocapillaris has taken place.

The edges of the lesion are presumably the most recently developed part. The lesion begins with transudation of an albumen-saturated fluid from the lamina elastica. The bulging of the center of the retina, clinically observed in very young lesions, as well as the glassy, pale yellow reflex at the posterior pole, corroborates this. The fine black granulation results from separation of the pigment epithelium in small sheets and clumps by the transudate. The outer retinal layers degenerate because of defective nutrition.

Possibly the lesion is in essence a senile involution of the membrana elastica, a sclerosis which compromises the metabolism, and results in the formation of a transudate which is inimical to the nourishment, of the external retinal layers. *F. H. Haessler.*

Bergmeister, R. **Primary and miliary tuberculosis of the retina.** Wiener med. Woch., 1929, v. 79, Aug. 24, p. 1116.

Its rarity and failure to produce it experimentally has bred skepticism in regard to the occurrence of primary retinal tuberculosis. The cases of retinal tuberculosis observed in the form of periphlebitis are generally regarded as extensions from peripheral uveal tuberculosis. A case history of primary miliary retinal tuberculosis in the form of wooly nodules covering the vessels, that came to autopsy in an individual with lupus erythematosus, is described. *M. Davidson.*

Brückner, Zaboj. **Visible blood circulation in retinal veins in a case of lymphosarcoma.** Oft. Sbornik, 1929, v. 3, pp. 509-521.

The author reports a case of multiple lymphosarcoma in a thirty-two-year-old man. The retinal veins of the left eye were markedly tortuous, and in some places showed fusiform dilatation, while in others they were narrowed. Through the narrowed veins the blood flowed like sand. The author thinks that the visible blood current was due to the pathological composition of the blood and the narrowing of the veins (Bibliography.) *G. D. Theobald.*

Clapp, C. A. **Crystalline deposits in the vitreous: report of two cases of calcium soap, studied microscopically and histochemically.** Arch. of Ophth., 1929, v. 2, Dec., pp. 635-642.

A modification of Bachstez' classification of deposits in the vitreous is suggested. The suggested classification is:

1. Fluid vitreous bodies with crystalline opacities: a, cholesterol crystals, white shining opacities sharply defined and giving the appearance of a snow storm; b, white opacities not sharply defined, leucine and tyrosine suspected.
2. Nonfluid vitreous bodies with crystalline opacities: a, sharply defined globules of slow movement, chiefly calcium soaps, histologically described and chemically studied; b, not sharply defined flakes, described clinically only.

One case is reported typical of group 1, type a. Two enucleated eyes and five reported are examples of group 2, type b.

A briefer classification might suffice, that is, "cholesterol crystals in the vitreous" and "calicum soaps in the vitreous". Neither title, "synchysis scintillans" nor "asteroid hyalitis", appears correct, in that they do not etymologically describe the conditions to which they are ascribed. *M. H. Post.*

Ehlers, Holger. **Retinitis pigmentosa and abnormal course of the long ciliary arteries.** Acta Ophth., 1929, v. 7, p. 321.

The writer reports macroscopic and microscopic findings in two pairs of eyes with retinitis pigmentosa; the two patients were brother and sister. Macroscopically there was in the equatorial zone a dissemination of small black dots in the retina. Microscopically there was pronounced degeneration of the

layer of rods and cones, and pigment accumulations in the retina close to the vascular walls, most marked at their bifurcation points. The author was particularly impressed with the length of the long posterior ciliary arteries, which pierced the sclerotic at a distance of 10.5 mm. temporally from the center of the optic nerve, and 8 mm. nasally. The unusually great episcleral length of the vessels in these eyeballs indicates a short choroidal course. The pathological area in retinitis pigmentosa is strikingly limited to the postequatorial zone, which depends for its nutrition upon the terminal ramifications of the long posterior ciliary arteries. The author suggests that abnormal episcleral length of the posterior ciliary arteries, resulting in deficient nutrition of the postequatorial zone, may be the underlying cause of retinitis pigmentosa.

Ray K. Daily.

Friedenwald, H. and J. S. **The retinal blood vessels in hypertension and arteriosclerosis.** Bull. Johns Hopkins Hosp., 1929, v. 45, Oct., p. 232.

From a study of the eyegrounds of approximately 2000 medical cases a working classification of retinal vascular disease has been formulated and the clinical correlations of each of the several types of lesions have been investigated. The groups in the classification are hypertension without retinal arteriosclerosis, retinal arteriolar sclerosis and albuminuric retinitis, retinal arteriosclerosis with hypertension, retinal arteriosclerosis without hypertension, syphilitic arteriosclerosis, and retinal arteriosclerosis resulting from local disease. *Ralph W. Danielson.*

Grønblad, Ester. **Angioid streaks. Pseudoxanthoma elasticum.** Acta Ophth., 1929, v. 7, p. 329.

This is a preliminary report of three patients, with the rare eye disease known as angioid streaks. The writer thinks that the disease is a manifestation of a general disease of the elastic substance, because the three patients had skin lesions known as pseudoxanthoma elasticum. Histologic examination of the skin revealed degeneration of the elastic tissue of the cutis. Two of these patients also had cardiac and vascular changes. *Ray K. Daily.*

Møller, H. U. **Familial angiomatosis of the retina and cerebellum—Lindau's disease.** Acta Ophth., 1929, v. 7, p. 244.

The essential features of the disease, sixty cases of which are reported in the literature, are angiomatosis of one or both retinas, symptoms of tumor of the brain, and familial incidence. In a study of the disease in 1928, Lindau reached the conclusion that the disease was an angiomatosis of the central nervous system, rooted in a congenital anlage in the third month of fetal life. The author points out that, while the prognosis for vision is bad and the ocular disturbance is not amenable to treatment, an early diagnosis and early surgical removal of the cerebellar tumor may save the patient's life. He reports a case with recovery, following surgical removal of the cerebellar growth found at the site common to tumors of the acousticus. Grossly it was a hyperplastic capillary hemangioma. The article is illustrated with a microphotograph of the tumor and a chart of the patient's family tree. The father, two brothers, and two nieces of the patient (one daughter of each brother) had died of the disease. The article contains histories of these cases, with autopsy findings in three cases.

Ray K. Daily.

Neuschueler, Ignazio. **Perimetric and periphotometric researches in a case of medullated nerve fibers.** Saggi di Oftalmologia, 1928, v. 4, p. 412.

The myelinated fiber areas were bilateral, unusually large, especially in the right eye, and all were found a considerable distance from the disc. The areas were three in number in the right eye and one in the left. Their size ranged from two to four disc diameters in length, by 1.5 to 2 inches in width.

Perimetry disclosed scotomas corre-

sponding to the areas of myelination. The light sense reaction in an opaque nerve fiber area was diminished when compared with that of a corresponding myelinated nerve-free area in the other eye. These functional disturbances are due to the dense myelin sheaths which constitute an obstacle to light passage and therefore to the light and chromatic sensibility of the retina.

F. M. Crage.

Triossi, S. **Papillo-retinal edema of the serous meningitis type in nephritis.** Saggi di Oftalmologia, 1928, v. 4, p. 317.

Among the numerous ocular manifestations of nephritis, the significance and the mechanism of production of retinal edema are obscure. The fourteen cases studied included acute, chronic, hypertensive, cardiovascular, and postscarlatinal nephritis in patients whose age ranged from seven to fifty-seven years. The vision and fields were normal in most of the cases, while in the others there was moderately diminished vision with moderately restricted but regular concentric contraction of the field for colors.

The author's observations showed that neuroretinal edema was caused by the same mechanism as caused the edema elsewhere in the body. Slight cerebral edema in the cases where endocranial pressure was elevated could account for the retinal edema in these patients. A local cause, probably in the form of retinal vascular disease, was held responsible for the fundus condition in other cases. *F. M. Crage.*

11. OPTIC NERVE AND TOXIC AMBLYOPIAS

Igersheimer, Joseph. **Optic nerve disease with malignant hypertension.** Zeit. f. Augenh., 1929, v. 69, Sept., p. 47.

In a patient with malignant hypertension (arteriosclerosis of brain, kidney, and spleen at autopsy) a severe disturbance of vision appeared associated with signs of papillitis—hazy disc margins, one or two diopters of swelling, three weeks later pallor. In the retina there were only a few tiny hemorrhages. Because of the relatively slight retinal changes, the loss of vision was ascribed to the lesion of the optic nerve, which was diagnosed as inflammatory. Anatomical study also showed the retina to be relatively slightly involved, but in the nerve only degenerative and no inflammatory changes were found. The author believes the changes to be due to interference with the metabolism of the nerve, and he emphasizes the fact that the nerve can be predominantly involved with relatively normal retina. Our conception of optic neuritis needs revision. In this instance the diagnosis of inflammatory neuritis based on hazy disc margins with great functional loss was erroneous. The real pathogenic papilla, which in turn was followed by hazy margins on the one hand and disturbances of function on the other.

F. H. Haessler.

Koyanagi, Y. **Angiomatous caverns** factor was a disturbance of circulation which produced a transudation into the **in the optic nerve.** Klin. M. f. Augenh., 1929, v. 83, Oct.-Nov., pp. 550-555. (3 ill.).

The left eye of a child of eight months was enucleated, the diagnosis being glioma of the retina, which was verified histologically. Independent of the glioma, angiomatous caverns probably congenital were found in the septa of the optic nerve. *C. Zimmermann.*

Löwenstein, Arnold. **Recent viewpoints in the treatment of tabetic optic atrophy with endolumbar and suboccipital pneumocephaly.** Klin. M. f. Augenh., 1929, v. 83, Oct.-Nov., pp. 548-549.

Löwenstein claims priority in devising this method of treatment (Wien. klin. Woch., 1928, v. 41, no. 4).

C. Zimmermann.

12. VISUAL TRACTS AND CENTERS

Carleton, H. H. **Ocular signs and the frontal lobes.** Trans. Ophth. Soc. United Kingdom, 1928, v. 48, pp. 463-470.

ERRATA

Through printer's error, lines 25 and 26 in the right hand column of page 276 were placed out of correct position. They should be placed following line 19 in the same column to read as follows:

The real pathogenic factor was a disturbance of circulation which produced a transudation into the papilla, which in turn was followed by hazy margins on the one hand and disturbances of function on the other.

F. H. Haessler.

UNIV OF MICH

Work by several experimenters has shown the existence in the frontal lobe of a small area, stimulation of which produces conjugate deviation of the eyes in all directions associated with movements of the head and neck, together with dilatation of the pupil. This excitable area is separated from the Rolandic cortex by a narrow inexcitable band. It is believed that the movements induced by stimulation of this area are closely bound up with the mechanism of attention, and are to be differentiated from the simpler reflex responses belonging to lower cerebral levels. The distinguishing features of the high-level response might be summarized under the phrase "attentive vision."

If the frontal lobes play an important part in the minute movements and adjustments of the eyes in attentive vision, it is possible to explain some of the ocular disorders of encephalitis and some of the psychoneuroses on the basis of disordered function at this level.

The variable and transient diplopia of encephalitis, occurring without gross nuclear lesion, can only be regarded as due to incoordination of conjugate movements initiated at the highest levels, namely in the cerebral cortex. Furthermore, the nystagmus or the nystagmoid jerkings, so common after encephalitis, are notably a release phenomenon due to defective cerebellar influence. The crossed connections between frontal lobe and cerebellum are well known, so it is not difficult to see that injury or disease of the frontal lobes may produce a degree of unsteadiness in ocular movements.

Another frequent disorder of ocular movements in encephalitis is disturbance of accommodation-convergence synkinesis. So closely is this dependent on the act of attention and to such a large extent is it initiated in the cerebral cortex, that it is quite plausible to explain its disturbances as due to a dysfunction of "attentive vision".

Pupillary movements are also closely linked with the effort of attention. As stimulation of the frontal cortex produces pupillary dilatation, we might as well expect to find a poverty of pupillary reaction in postencephalitic cases. Numerous cases of psychoneurosis exhibit a multiplicity of minor oculomotor disturbances, both transitory and inconstant. They all seem related to the patient's poor voluntary efforts of attention and to fatigue. *A. B. Bruner.*

Lenz, George. **On the anatomic basis of ophthalmoplegia interna.** Zeit f. Augenh., 1929, v. 69, Sept., pp. 102-113.

While formerly it was believed that ophthalmoplegia interna resulted from a nuclear lesion, the modern tendency is to seek the lesion in the nerve stem of the third cranial nerve. According to Fuchs the neurons innervating the internal ocular muscles are axially placed. The analogy to the vulnerability of the axial fibers of the optic nerve, with their frequent isolated involvement, immediately suggests the assumption that an isolated axial oculomotor neuritis is the cause of ophthalmoplegia. Anatomic studies are not available. The extreme mydriasis accompanying the condition in forty percent of the cases suggests that the sphincter tonus is completely destroyed, and this points to a lesion in the ciliary ganglion or peripheral to it. Cases of botulism, in which it occurs bilaterally, are possibly in another category. In the one instance in which Lenz was able to make an anatomical study in the ophthalmoplegia of botulism, the lesion was nuclear. Against the assumption of the seat of lesions in the ciliary ganglion or peripheral to it is the fact that in the unilateral cases which are luetic in origin some form of pupillary disturbance is often present on the other side. The etiology, aside from botulism, is lues and metalues in eighty percent of the cases. Lenz has observed one instance clinically, and has made an anatomical study of the brain and nerves. The patient's right pupil did not react to light and only slowly to accommodation, while the left eye presented a picture of ophthalmoplegia interna. On the right side there was a

severe lesion of the dorsal small-celled nucleus and of the neighboring afferent pupillary reflex arc, which was also injured at two points further back. On the left side the primary and most important lesion involved the frontal tip of the principal nucleus itself. This, with extension of the lesion to the contiguous half of the median nucleus, was the anatomic basis for the ophthalmoplegia interna. *F. H. Haessler.*

13. EYEBALL AND ORBIT

Cæsar, Julius. **Intermittent exophthalmos.** Oft. Sbornik, 1929, v. 3, pp. 463-466.

In March, 1927, a male aged twenty years, while lifting a heavy load, had a sudden pain in the right orbit. Almost immediately a hematoma developed under the conjunctiva. The eyeball protruded so that the lids could not close completely. The eyeball receded as the hematoma was absorbed. Since then, when lifting heavy loads the eyeball spontaneously protrudes, without disturbance of vision. After four to six minutes pressure it again recedes. Physical and fundus examinations were negative. It is the author's opinion that the hematoma caused a loosening of the intraorbital tissue and muscles, and that the exophthalmos is due to venous stasis. *G. D. Theobald*

Triossi, S. **Giant mucocele of the frontal sinus.** Saggi di Oftalmologia, 1928, v. 4, p. 184.

A man aged forty years had noticed a mild protrusion for a period of eighteen months. In the five or six weeks preceding his first examination, there was a considerable increase in the exophthalmos as well as a troublesome diplopia and a notable diminution in visual ocuity.

Previous history was negative as to injury, nasal disease, and symptoms referable to endocrine disturbance.

Examination revealed a marked left exophthalmos, comparatively normal opening of the palpebral fissure, slight ptosis of the upper lid, slight exotropia, and marked hypotropia. There was no palpable orbital mass, and neither crepitus nor pulsation. Excursion upward was completely abolished, mobility nasally and temporally was moderately limited. Mild anisocoria was noted, the left pupil being larger. Corrected vision was reduced to 0.2.

The disc was hyperemic, and its margins indistinct. Mild peripapillary retinal edema was present. The veins were tortuous. Visual field examination showed concentric contraction for colors, more marked for green.

Rhinologic examinations revealed no pathology. Transillumination showed moderate darkening of the left frontal sinus. Roentgenologic examination demonstrated a lack of the line normally corresponding to the supraorbital margin.

An incision was made through the entire superciliary line. By aspiration of the mass extending into the orbit from above, 25 c. c. of chocolate-colored liquid containing serum, mucus, and cholesterin was withdrawn. After dissection of the sac and scraping of the hypertrophic sinus mucosa, drainage was instituted, and healing by primary intention resulted after the third day, when the drain was removed permanently.

After a year the exophthalmos was still absent, a very slight diplopia remained as a symptom of a partial paralysis of the left superior rectus, the superior oblique, and the external rectus. All fundus pathology had disappeared except for a slight peripapillary retinal edema, and the corrected vision was 0.4.

Pathologically the case presented a cystic degeneration of the sinus mucosa. *F. M. Crage.*

14. EYELIDS AND LACRIMAL APPARATUS

Basterra, J. **Late results of dacryocystorhinostomy.** Arch. de Oft. Hisp.-Amer., 1929, v. 29, Aug., p. 485.

The author has been practising his method since the year 1924 and has operated on 244 patients. After cutting

the lacrimal bone he makes one wide flap in the mucosa as large as the hole in the bone, with its base toward the front of the nose. This flap is then sutured to the anterior edge of the lacrimal sac, which has previously been incised from above downward in the middle of its nasal wall. The posterior half of the sac is removed. This technique has always been found very successful and the author claims it can be used in all conditions, when the sac is small, or when there are ethmoidal cells in the wound, or both together.

Of his operations eighty-five to eighty-eight percent have been entirely successful, eight to ten percent have been partially so, and five to seven percent were failures.

M. Uribe Troncoso.

Barrio, A. del. **Dacryocystorhinostomy and its different techniques.** Arch. de Oft. Hisp.-Amer., 1929, v. 29, Jan., p. 18.

In this interesting article Barrio gives at length the history of the method in several countries, especially in Spain, where the technique of Dupuy-Dutemps has been modified and is widely used. The more important procedures of Spanish ophthalmologists are those of Basterra, Arruga, and Fazacas.

Arruga has modified the operation in its more difficult stage, that is, the cutting and suturing of the flaps in the nasal mucous membrane, which he replaces by resection of this membrane over an area of seven to nine millimeters. The sac is incised in a vertical direction and its internal part is resected or not, according to its size. It is then sutured to the anterior border of the periosteum of the internal margin of the hole in the bone. Blanco considers that this technique has not been very successful, especially because it avoids the suture of the two mucous membranes, thus suppressing the fundamental part of the modern technique.

Dr. Fazacas has a special technique modified from Toti. After trephining the lacrimal crest and the unguis as far as the upper end of the nasal canal, he excises the nasal mucous membrane in the whole surface of the bony hole, then cuts the sac down and dissects it from below upward, from the entrance of the canal to the tendon of the orbicularis. Two or three stitches are passed on the inferior part of the sac, and then introduced through the hole in the bone and drawn with a hook out of the nasal cavity. In this way the whole sac is drawn toward the bony hole through which it penetrates. The sutures are then fixed on the skin outside of the nose with a piece of adhesive plaster. Four or five days afterward adhesions are formed between the sac and the mucous membrane and the stitches are withdrawn. This anastomosis of the sac follows principles similar to those used by general surgeons with the ureters, when the bladder is removed and they try to obtain drainage of the urine into the rectum. Fazacas' technique is simpler than all the others because the making of flaps and the sutures in the mucosa are omitted.

The author is partial to the method of Dupuy-Dutemps, which he has used a number of times, but, if the mucous membrane has been perforated or torn in its lower part, which is very frequent in some operations through the sinus, he uses the method of Basterra, making a single flap of mucosa with the base in, which he sutures to the anterior margin of the sac. If the mucous membrane has been hopelessly lacerated either because it is very fragile or by excess of handling when the bony partitions of the ethmoidal cells are taken off, or finally when there is a persistent hemorrhage which needs too much sponging, he invaginates the sac according to Fazacas' method.

He is not in favor of the West-Polyak technique which he considers very similar to the original Toti. An extensive bibliography ends the article.

M. Uribe Troncoso.

Camison, A. **Functional synergia between mastication and elevation of the superior lid. (Marcus Gunn sign).** Arch. de Oft. Hisp.-Amer., 1929, v. 30, Sept., p. 560.

This rare anomaly was seen in a man twenty-three years old, without any history of consanguinity or family disease. As a child the patient had ptosis on the left side which disappeared when he was eating. At present the ptosis is moderate and there is a paralysis of the superior rectus of the same side. When he is at rest or speaking the defect is not noticeable, but as soon as he begins to chew there are alternate movements of elevation and descent of the upper lid. There is considerable impairment of vision of this eye, which can not be improved by glasses. The left fundus is normal. The right eye is normal. The author is not partial to the many theories advanced to explain this anomaly. He does not favor the subcortical theory of Lutz or the cortical theory of Demaria, who believes that in the monkey and perhaps in man the cortical centers of the elevator, the hypoglossus, and the mastication center are very near together and may communicate with each other by the fibers of Meynert.

M. Uribe Troncoso.

Fazakas, A. **The topography of the lacrimal punctum, with special consideration of the mechanism of the upper portion of the tear passages.** Klin. M. f. Augenh., 1929, v. 83, Oct.-Nov., pp. 452-460. (7 ill.)

From his studies of the lacrimal passages Fazakas came to the conclusion that some cases of epiphora of uncertain origin have the common clinical aspect of atonic epiphora, and he emphasizes that the normal mechanism of the initial part of the conducting apparatus is a condition for its function. Apart from atony of Horner's muscle, which is an acquired affection, he found congenital anomalies of the tear points and abnormal conditions of the plica semilunaris and caruncle to be of importance.

C. Zimmermann.

Forsberg, C. W., and Stern, M. A. **Blastomycosis of the eyelid.** Journal-Lancet, 1929, v. 49, Nov. 1, p. 498.

A farmer, aged twenty-one years, had a warty, crusty growth about the right eyelid. It had begun three months previously as a tiny papule, but had not invaded the eyebrow or the conjunctiva. The growth resembled an epithelioma, yet a purulent fluid could be expressed. There had been much itching. The general health was good. A biopsy was positive for blastomycosis. The growth was treated with radium locally, sodium iodide intravenously, and potassium iodide by mouth. Ten days later the mass sloughed off.

Ralph W. Danielson.

Gernet R. **Operation for trichiasis of the lower lid.** Klin. M. f. Augenh., 1929, v. 83, Oct.-Nov., pp 525-526.

After slight canthotomy and application of Kuhnt's lid clamp, the intermarginal incision is made and the ciliary portion excised by an incision parallel to the first, bordered by small vertical cuts at the temporal and nasal ends. Then a strip of the orbicularis is removed and the lower edge of the wound sutured four millimeters below the inner edge of the lid. Under dressings with ointments the exposed wound surface is gradually covered by epithelium growing from the edges and forms a hairless lid border of pleasant appearance.

C. Zimmermann.

Hayri, H. **Tears of blood in a hysterical young girl.** Türk Oftalmoloji Gazetesi, 1929, v. 1, Jan., p. 46.

Hayri describes the case of a young girl complaining of bloody tears appearing first in the right eye but later in both. Suspicion was aroused by the fact that the condition always appeared at a time when no witnesses to the onset were present. By suitably concealing himself from the patient, Hayri was able to discover her in the act of pricking her finger with her blouse pin and applying the blood to her eyes. He believes that many of the cases reported in the literature may be of similar nature.

Phillips Thygeson.

Ismet, N. and Mouzaffer. **Plexiform neuroma of the upper lid with Recklinghausen's disease.** Türk Oftalmoloji Gazetesi, 1929, v. 1, April, p. 115.

A young man, aged twenty-five years, presented himself complaining of a swelling and drooping of the left upper lid which interfered with the vision of that eye. The condition had been present to a lesser degree as long as he could remember, and had at no time been painful. The patient also had numerous coffee-colored spots of varied dimensions scattered over his body. These his parents stated had been present from birth. Eight years previously a number of painless swellings had appeared on his body, commencing first on the right arm and always retaining the same form. On examination these appeared as diffusely pigmented nodules, apparently composed of soft, fiberlike masses. The lid tumor was the size of a walnut, cordlike in character, causing the lid to be fixed in ptosis. The conjunctiva beneath was markedly thickened, roughened, and congested. At operation the main mass was removed, with consequent relief of ptosis. A portion examined histologically revealed the presence of conjunctival cells in nests scattered among numerous atrophic nerve fibers. The authors believe then that this case presented a mixed picture of plexiform neuroma with multiple neurofibromata. The close relationship between the two has long been recognized, and in this instance the plexiform neuroma was the first manifestation of Recklinghausen's disease.

Phillips Thygeson.

Judge, H. V., Mott, W. C., and Gabriels, J. A. C. **Ankyloblepharon filiforme adnatum.** Arch. of Ophth., 1929, v. 2, Dec., pp. 702-708.

The mode of origin of such cases is the most interesting problem connected with them. In the condition so designated, elastic strands connect the margins of the lids with one another and interfere with their normal movements. The title does not apply to those cases in which there is direct partial or total adhesion of the lid margins at birth. Nine cases have previously been reported.

The bands are usually unilateral and generally single. They vary from one to ten mm. in length and from three to five mm. in breadth. The case reported was unusual in that the bands were multiple. The attachment to the lid is between the cilia and the orifices of the meibomian glands. The location along the lid margin is variable. They are remarkably elastic, due to the presence of connective tissue in them.

Wintersteiner concludes that the connective tissue and epithelial union between the lids occurs during fetal life when lid cleavage is still incomplete, due to an epithelial loss at the margin of the lid. He found the muscle of Riolan incompletely developed and its fibers misdirected, which he regarded as a sequel rather than as a causative factor.

Embryologically, the lids appear at the 16 mm. stage, and fusion is complete at the 13 mm. stage. At the end of the sixth month, lid fusion is terminated. A temporary arrest in the growth of the epithelium or a more rapid proliferation of the mesenchyma may occur, permitting union between the mesenchyma of the upper and lower lids without the interposition of epithelium, and later, when the surrounding epithelial union is dissolved, the mesenchymal union persists and undergoes stretching. The origin of the bands from the white line suggests that this anomaly occurs as a congenital deviation and should be classed with other anomalies of development.

M. H. Post.

Kanbai, G. **A needle for epilation and transplantation of eyelashes.** Klin. M. f. Augenh., 1929, v. 83, Oct.-Nov. pp. 530-533. (2 ill.)

A hollow injection needle catches the lash and is carried into the skin in the direction of growth of the lash. The point of the lash appears in a lateral window of the needle from which it is extracted in toto, without damage, so that it can be transplanted with its adherent tissues. The instrument is illustrated, with description of the method. *C. Zimmermann.*

Kemal, M. **Glaucoma following a plastic operation on the lower lid.** Türk Oftalmoloji Gazetesi, 1929, v. 1, April, p. 124. (See Section 8, Glaucoma and ocular tension.)

Kurz, Jaromir. **Operative treatment of trachoma.** Oft. Sbornik, 1929, v. 3, pp. 165-194.

The methods used by various authors in complications of the upper and lower lids are reviewed. Operative procedure is influenced by the condition found in the individual patient. The author describes in detail an operation which he devised for the correction of entropion due to trachoma or other causes. Two c.c. of four percent syncain-adrenalin solution are injected into the lid. On the everted lid, an incision is made in the intermarginal space, the entire length of the tarsus. The incision is made 2 mm. deep, parallel to the tarsal conjunctiva. The knife is then tilted at an angle of 40°, and the incision is carried obliquely through the entire thickness of the tarsus. A prism-shaped piece of cartilage with skin attached is obtained from the antihelix, by making two parallel incisions 2 to 2.5 mm. apart, and the desired length of the graft. This is placed in the incision made in the lid, and is held in place with mattress sutures tied on the skin surface over pearls. (5 illustrations. Bibliography.)

G. D. Theobald.

Martin, R. C. and Cordes, F. C. **Toti-Mosher operation in obstruction of the nasolacrimal duct.** California and West. Med., 1929, v. 31, Oct., p. 268.

The authors believe that dacryocystectomy is not the operation of choice except in clearing up infection in preparation for intraocular surgery. They feel that chronic suppurative dacryocystitis of long standing is no contraindication, but there should be no stricture between punctum and sac. Team work with a rhinologist is urged, because preliminary intranasal procedures are often necessary. In the operative technique the importance of early postoperative lavage is emphasized. The results of fourteen cases are tabulated, there being one failure. (Discussion.)

Ralph W. Danielson.

Pacalin, G. **Simple procedure for anesthetizing the lower point of the lacrimal sac.** Ann. d'Ocul., 1929, Sept., v. 166, pp. 730-732.

After lavage of the sac with one percent cyanide of mercury a five percent cocaine solution is instilled into the sac. The walls and top of the sac are anesthetized with four percent scurocaine with scurenalin. With a five centimeter needle two cubic centimeters of the same solution are injected near the opening of the sac into the lacrimal canal. The needle is directed as is the Bowman's probe in its final position for introduction into the nasolacrimal duct.

Lawrence Post.

Poljak, G. D. **Contributions to the treatment of lacrimal obstruction.** Klin. M. f. Augenh., 1929, v. 83, Oct.-Nov., pp. 510-515. (4 ill.)

Poljak describes a modification of Toti's dacryocystorhinostomy which in sixty cases gave him better results than the methods of Toti, Dupuy-Dutemps, and others.

C. Zimmermann.

Rubbert, I. I. **In lesions of the lacrimal canaliculi in trachoma.** Archiv Oftalmologii (Russian), 1929, v. 6, pts. 2-3, pp. 160-166.

In a patient affected with trachoma, slight swelling and redness were noticed in the region of the left upper canaliculus. The corresponding punctum appeared to be dilated. Pressure upon the area of infiltration was followed by a mucopurulent discharge from the punctum. Prowazek bodies were discovered in epithelial scrapings from the canaliculus and, on histologic examination of its mucous membrane, signs of a chronic proliferative inflammation of the type described by Birch-Hirschfeld in trachoma were found.

M. N. Beigelman.

NEWS ITEMS

News items in this issue were received from Drs. C. A. Clapp, Baltimore; Gaylord C. Hall, Louisville; M. Paul Motto, Cleveland; G. Oram Ring, Philadelphia, and F. L. Wicks, Valley City, North Dakota. News items should reach **Dr. Melville Black**, Metropolitan building, Denver, by the twelfth of the month.

Deaths

Dr. Cyril Barnert, New York, aged forty-six years, died January eighth.

Notice has been received recently of the death of Professor H. Snellen of Utrecht.

Dr. Robert Douglas Alway, Aberdeen, South Dakota, aged sixty-one years, died December twenty-first.

Dr. X. L. Anthony, Spokane, aged fifty-eight years, died November twenty-ninth of carcinoma of the pancreas.

Dr. James Allen Patterson, Colorado Springs, Colorado, aged sixty-eight years, died November twenty-seventh, of adenoma of the prostate and pyelonephritis.

Dr. Philip H. Moore, ophthalmic surgeon to the Methodist Episcopal Hospital in Philadelphia, died December sixteenth. Dr. Moore had been associated with the Methodist Episcopal Hospital for about twenty years, conducting there a large clinical service. His war work in France was notable, as the ophthalmic head of several of the war hospitals. He was president of the staff of the Methodist Episcopal Hospital.

Miscellaneous

The Manhattan Eye, Ear, and Throat Hospital, New York, was left $2,000 under the will of the late Edwin C. Moller.

Dr. John P. Bowler, dean of Dartmouth Medical School, Hanover, New Hampshire, announced November 26, 1929, that Mr. John D. Rockefeller, Jr., had given $80,000 to the school for research in physiologic optics. (Journal American Medical Association, January 11, 1930.)

A course in physiological optics is being given March 3 to 15 by Dr. Edward Jackson under the auspices of the Saint Louis Ophthalmic Society.

In the last two years the California state department of health has distributed, for the prevention of blindness in babies, 26,406 outfits each consisting of two ampoules containing two drops each of a two percent solution of silver nitrate. The state law requires the department to distribute this product.

The first gold medal awarded by the New York Academy of Medicine has been conferred on Dr. Carl Koller. The citation read as follows: "Dr. Koller, distinguished ophthalmologist, able in the field of biology, painstaking in research, the discoverer of the anesthetic properties of cocaine, the inaugurator of the era of local anesthesia, conferring on humanity an enormous relief from suffering, a fellow of this Academy since 1898, in recognition of his services is awarded this first Academy medal." (Journal American Medical Association, January 25, 1930.)

A recent issue of the Zeitschrift für Augenheilkunde contains an echo of the world war in the form of an invitation to doctors who took part in the Belgian campaign and who have private notes or drawings as to injuries from blunt-nosed bullets fired by the Belgian civil population in 1914 to send such documents to the German imperial archives in Potsdam.

Announcement is made of a new monthly review of ophthalmology, "Los Annaes de Oculistica do Rio de Janeiro," which will serve as the official organ of the ophthalmologic clinic of the faculty of medicine of Rio de Janeiro, Brazil, and also of the Brazilian Ophthalmological Society. The new journal will be edited by Drs. Abreu Fialho, senior and junior, the journal address being Rua dos Ourives, 7, Rio de Janeiro, Brazil.

The Thirteenth International Congress of Ophthalmology adopted the following motion presented by Professor Soria of Barcelona, Dr. Lijo Pavia of Buenos Ayres, and Dr. M. Davidson of New York: "The Thirteenth International Congress of Ophthalmology sees with concern the tendency in several countries toward separating the examination of the refraction of the eyes from ophthalmology and placing it legally in the hands of so-called optometrists. It condemns this tendency as inimical to the interests of the public and of the science of ophthalmology, and recommends that the complete examination of the eyes for the licensing of various occupations be retained in the hands of ophthalmologists by law."

The Commonwealth Fund of New York City has just made a gift of $250,000 to the department of ophthalmology of Washington University for research in trachoma over a period of five years. The board of the Commonwealth Fund indicated that it would be inclined to continue the grant beyond the five-year period on the basis of demonstrated results and continued need. The research in trachoma and allied diseases will be conducted in the Oscar Johnson Institute of which Dr. Harvey J. Howard is the director. The Oscar Johnson Institute and McMillan Hospital are now being erected by Washington University and should be ready for occupancy the latter part of this year. Dr. Charles Weiss and Miss Marion Morris, with the assistance of technicians, are already

working with Dr. Howard on the bacteriological and cytological phases of the trachoma problem. The gift from the Commonwealth Fund and the facilities of the new Oscar Johnson Institute will make it possible to organize an all around attack on the trachoma problem.

Personals

Dr. J. Frank Crouch is spending the winter in Lake Wales, Florida.

Dr. C. D. Townes of Louisville, Kentucky, is now associated with Dr. A. O. Pfingst in the practice of ophthalmology.

Dr. Ben Witt Key read a paper before the Baltimore Ophthalmological Society, January 27, on "Do Corneal Scars Move?"

Drs. Gifford, Patton, Callfas, Potts, Cassidy, and Fairchild of Omaha announce that Dr. J. Hewitt Judd is now associated with them in ophthalmology.

Dr. Charles T. Moran, of Louisville, Kentucky, is now associated with Dr. Claude T. Wolfe in the practice of eye, ear, nose and throat.

Dr. L. Webster Fox, of Philadelphia has been reelected president of the Home Teaching Society for the Blind, Philadelphia.

Drs. Bascom H. Palmer and Gail E. Chandler, of Miami Beach, Florida, have joined the Roney Medical Clinic in the capacity of ophthalmologists and otolaryngologists.

Dr. William J. Harrison of Philadelphia has been awarded the Corinna Borden Keen scholarship for one year to pursue graduate work in ophthalmology under Dr. Ignacio Barraquer of Barcelona, Spain.

Dr. H. Maxwell Langdon of the graduate school of the University of Pennsylvania delivered a lecture, Friday, January tenth, in connection with the Postgraduate Seminar of the Philadelphia Medical School, upon ophthalmic signs of nervous disease.

Dr. Samuel Theobald of Baltimore, who is now in his eighty-fourth year, was honored January twenty-third by a celebration of the fiftieth anniversary of his discovery of the value of boric acid in the eye. The ceremonies were conducted under the auspices of the ophthalmologic section of the Baltimore City Medical Society.

Societies

At the December meeting of the ophthalmic section of the College of Physicians of Philadelphia, Dr. Maxwell Langdon was elected chairman and Dr. Fewell secretary for the year 1930.

The 154th regular meeting of the Ophthalmological and otolaryngological section of the Academy of Medicine was held in Cleveland on Friday, January twenty-fourth. A symposium on sinus disease was the feature of the evening.

The North Dakota Academy of Ophthalmology and Otolaryngology held its January meeting in Fargo on the eleventh, Dr. George M. Constans of Bismarck presiding. The following were elected to active membership in the Academy: Drs. Arthur Joistad and Trygve Oftedal, Fargo; Henry O. Ruud, Grand Forks; and Leroy G. Smith, Mandan.

At the forty-sixth annual meeting of the Tri-States Medical Association (Mississippi, Arkansas, and Tennessee) at Memphis, January 14th to 16th, Dr. Walter B. Lancaster, Boston, spoke on the value of an ophthalmic examination to the general practitioner.

At the January meeting of the Cleveland Ophthalmological Club, Dr. Edward B. Heckel of Pittsburgh presented an extensive address on "Some personal observations on restoration of the eyelids and the surgery of the lids". Dr. Heckel illustrated his lecture with lantern slides.

The Oxford Ophthalmological Congress will meet this year on July 10, 11, and 12.

The Ophthalmological Society of the United Kingdom will celebrate its jubilee at the annual congress on April 3, 4, and 5, 1930.

The "Questions and Answers" department.

As this is being written the first announcement of this new department is in the press. It will require several months to establish the department, and in the meantime we wish to call it to the attention of our readers each month, in order that they will not forget about the department but will send us such questions pertaining to ophthalmology as may occur to them. To these we shall try to obtain answers from the best authorities available.

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